



**U. S. Department of Energy
Federal Energy Technology Center**

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P.O. Box 10940
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September 8, 1999

TO: ALL PROSPECTIVE APPLICANTS

**SUBJECT: Program Solicitation for Financial Assistance Applications for "Research and Development of Technologies for the Management of Greenhouse Gases,"
Program Solicitation Number DE-PS26-99FT40613.**

The purpose of this executive summary letter is to highlight some important elements of the Program Solicitation. This letter is not an integral part of the solicitation. The solicitation is a self-contained document. In the event of any conflict between the contents of this executive summary letter and the contents of the solicitation, the solicitation language will prevail.

The objective of this effort is to provide economically competitive and environmentally safe options to offset all projected growth in baseline emissions of greenhouse gases by the U.S. after 2010, with offsets starting in 2015, to achieve the long-term cost goal in the range of \$10/ton of avoided net costs for carbon sequestration, and to offset at least one-half the required reductions in global greenhouse gases, measured as the difference in a business-as-usual baseline and a strategy to stabilize atmospheric CO₂ concentrations at 550 ppm, beginning in the year 2025. The latter goal represents the global potential for these technology options if broadly applied by the United States and other countries.

In an effort to stimulate the greatest possible interest and allow the widest latitude of response, the government will utilize the enclosed solicitation method. While the Government encourages latitude, it is also our desire to develop an integrated program that emphasizes complementary technology throughout the breadth of innovative methods of CO₂ sequestration.

Blank areas appearing in this solicitation, indicated by "[TBD]" will be completed after negotiations. The solicitation is divided into seven sections as follows: (The sample award document is contained in Sections I-IV).

- Section I Face Page (DOE F 4600.1)
- Section II Special Terms and Conditions
- Section III Intellectual Property Provisions
- Section IV List of Attachments
 - Attachment A--Statement of Project Objectives
 - Attachment B--Reporting Requirements
 - Attachment C--Budget Page(s)
 - Attachment D--Recipient Acquired Property
 - Attachment E--Federally Owned Property -- Government
Furnished
- Section V Conditions and Notices
- Section VI Application Preparation Instructions
- Section VII Evaluation and Selection

Each application will be objectively reviewed on its own merit against the evaluation criteria stated in Section VII using technical, scientific and/or peer reviewers, some of whom may be non-Governmental personnel. Should an Applicant object to review of their application by individuals other than Government employees it shall so state in Volume I of its application. Applicants are, however, cautioned that the DOE may be unable to give full consideration to applications which indicate that only Government evaluation is authorized.

Individuals, corporations, nonprofit organizations, small and small disadvantaged businesses, educational institutions, and state or local governments or other entities who wish to have an application evaluated should respond to the requirements of this solicitation.

Applications submitted by, or substantially relying upon the technical expertise of, Federally-Funded Research and Development Centers (FFRDCs) and Department of Energy (DOE) Management and Operating (M&O) contractors are not desired, will not be evaluated, and will not be eligible for an award under this solicitation. Offerors are encouraged to maximize the use of private sector organizations in the performance of the proposed effort. However, an application that includes performance by an FFRDC or DOE M&O contractor(s) as a subcontractor will be evaluated and may be considered for award, provided that: (1) the proposed use of any such entities is specifically authorized by the cognizant agency for the FFRDC or DOE for DOE M&O contractors, in accordance with the procedures established for the FFRDC or the M&O contractor; (2) the work is not otherwise available from the private sector; and (3) the estimated cost of the FFRDC or M&O contractor work does not exceed 25 percent of the total estimated project cost. DOE reserves the right to fund the work through a DOE field work proposal or an interagency agreement.

The Government anticipates multiple awards, each in the form of cooperative agreements, but reserves the right to award the type of agreement deemed in its best interest.

DOE plans to spread among the successful Applicants funds totaling \$15-18 million. Project periods are estimated to have a duration of 36 months.

Cost-Share: Offerors are advised that cost sharing is not required but encouraged.

The Government does not anticipate providing any facilities or property for accomplishing this effort. Applicants are encouraged to propose utilization of existing facilities and make allowance for providing all necessary personnel, facilities, and materials to complete the proposed activity. Applications must be submitted in accordance with the requirements of the Program Solicitation (See Section VI). Applicants are also advised to give particular attention to the evaluation criteria identified in Section VII. Each of the required application parts should be bound separately and clearly labeled. This solicitation contains multiple due dates for receipt of applications as stated in Article 5.13. Applications must be received by the due dates specified and submitted to the address below.

U.S. Department of Energy
Federal Energy Technology Center-Morgantown Site
ATTN.: Deborah J. Boggs
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Applications must authorize a period for acceptance by the Government of not less than one hundred eighty (180) calendar days from the date specified for receipt of applications.

All requests for explanation or interpretation of any part of the solicitation shall be submitted in writing to the Contract Specialist at the aforementioned address. Your written questions must be received by the Contract Specialist within 15 calendar days prior to the application due date to allow sufficient time for a reply to reach all prospective applicants before the submission of their application. If the Government elects to answer the questions, the questions will be answered via an amendment to the solicitation, with copies of both questions and answers included in the amendment, without reference to the originating sources. All amendments will be posted on the FETC Homepage at "<http://www.fetc.doe.gov/business/solicit/>"; therefore, applicants are encouraged to periodically check the FETC Homepage to ascertain the status of any amendments as hard copies will not be distributed.

For your information, it is recommended that all prospective applicants download a copy of the DOE "Lobbying Brochure" (<http://www.pr.doe.gov/lobbying.html>) which provides a summary of the statutory and regulatory restrictions regarding lobbying activities for Federal contractors and recipients.

Please note that an automated document writing system has been used to prepare this document. Each provision in the data base has been assigned a number. Not all of the provisions in the data base have been used in this document; therefore, the numbering may not be continuous.

All communications concerning this solicitation should cite the Program Solicitation number and be directed in writing to the attention of the Contract Specialist via mail at the letterhead address, via fax at (304)285-4683, or via E-mail at "dboggs@fetc.doe.gov".

Sincerely,

Deborah J. Boggs
Contract Specialist
Acquisition and Assistance Division

**DEPARTMENT OF ENERGY'S
FEDERAL ENERGY TECHNOLOGY CENTER**

PROGRAM SOLICITATION for COOPERATIVE AGREEMENTS

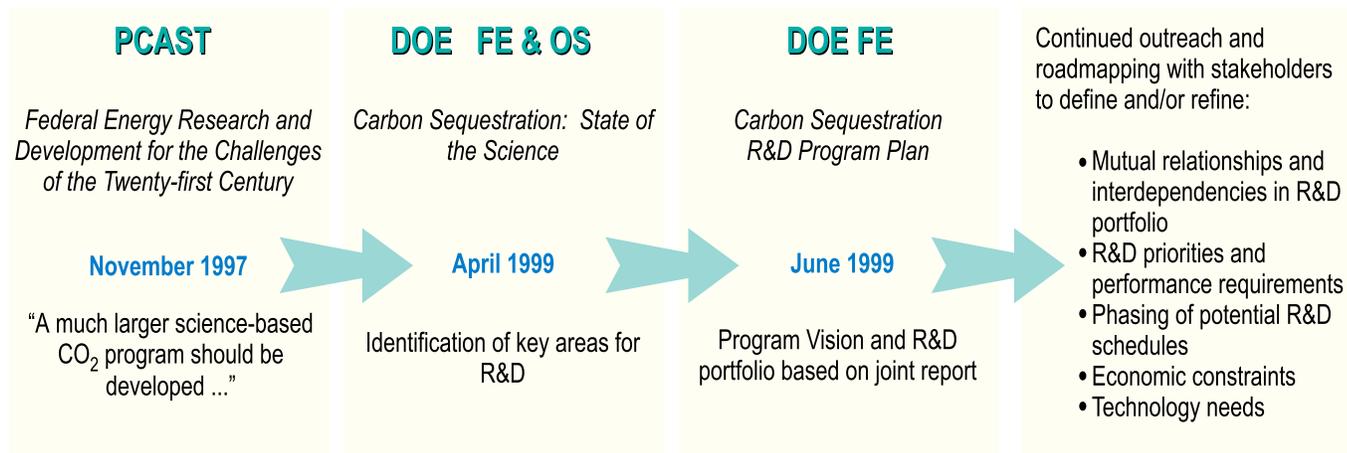
"RESEARCH AND DEVELOPMENT OF TECHNOLOGIES FOR THE MANAGEMENT OF GREENHOUSE GASES"

ANNOUNCEMENT NO. DE-PS26-99FT40613

Introduction

The Federal Energy Technology Center's Carbon Sequestration Program Plan is based on an ongoing series of collaborative efforts with stakeholders. The program's vision and R&D portfolio, for example, are directly related to the joint DOE Office of Fossil Energy (FE) and Office of Science (OS) draft report on **Carbon Sequestration: State of the Science**. The State of the Science report is, in part, an outgrowth of the President's Committee of Advisors on Science and Technology (PCAST) report, **Federal Energy Research and Development for the Challenges of the Twenty-First Century**. The Carbon Sequestration Program Plan evolved directly from the PCAST report and the joint FE and OS working paper, as shown in the Figure below.

The availability of clean, affordable energy is essential for the prosperity and security of the United States and the world in the 21st century. Emissions of CO₂ into the atmosphere are an inherent part of electricity generation, transportation, and building systems. However, increases in CO₂ emissions from energy systems and other human activity may be causing changes in the earth's climate, changes that could be harmful to human health and global economic prosperity. Much uncertainty is associated with the global climate change issue, but it is possible, even likely, that deep cuts in net CO₂ emissions from human activity will be required over the next 50 to 100 years.



Carbon sequestration enables the continued use of fossil fuels in energy systems while addressing stabilization of atmospheric CO₂ levels. Carbon sequestration includes capturing CO₂ gas from fossil energy technologies and other point sources and sequestering it, as well as reducing atmospheric concentrations by enhancing the uptake of CO₂ through natural sinks (e.g., forests, oceans, soil). The energy sector is responsible for roughly 90 percent of the U.S. greenhouse gas emissions, and 85 percent of the current U.S. energy system is based on fossil fuels. It is therefore prudent and sensible to invest today in carbon-sequestration R&D to enable the continued use of fossil fuels in a carbon-constrained economy.

There is a growing acceptance within industry, academia, and the general public that reduced carbon emission energy systems, transportation systems, and industrial processes may be necessary. It is generally accepted that efficiency improvements, use of alternative energy sources, and other incremental changes may not be sufficient to stabilize the concentration of CO₂ in the atmosphere. Carbon-sequestration R&D is needed so if actions are required to reduce carbon emissions in the future, low cost options can be executed with minimal impact on the economy.

The main challenges for the FETC Carbon Sequestration Program are to reduce the cost of sequestration, develop a broad suite of sequestration options, and ensure that long-term sequestration practices are effective and do not introduce any new environmental problems.

There is a strong role for the federal government in the development of CO₂ capture and sequestration technologies. First, the motivation for sequestration R&D — the greenhouse effect — is inherently a public issue. There are no isolated cause and effect relationships between specific CO₂ emissions sources and local climate effects that could motivate individual action. Second, the private sector is unlikely to conduct significant R&D to develop sequestration technologies. From the PCAST report: ***“This is very high risk long-term R&D that will not be undertaken by industry alone without strong incentives or regulations, although industry experience and capabilities will be very useful.”***

The specific goals of the FETC Carbon Sequestration Program are:

- Provide economically competitive and environmentally safe options to offset all projected growth in baseline emissions of greenhouse gases by the U.S. after 2010, with offsets starting in 2015.
- The long-term cost goal is in the range of \$10/ton of avoided net costs for carbon sequestration.
- Offset at least one-half the required reductions in global greenhouse gases, measured as the difference in a business-as-usual baseline and a strategy to stabilize atmospheric CO₂ concentrations at 550 ppm, beginning in the year 2025.

The latter goal represents the global potential for these sequestration options if broadly applied by the United States and other countries.

Associated technical objectives are to (1) drive down the cost of CO₂ separation and capture from energy production and utilization systems, (2) establish the technical, environmental, and economic feasibility of carbon sequestration using a variety of storage sites and fossil-energy power systems, (3) determine the environmental consequences of large-scale CO₂ storage, (4) develop opportunities to integrate fossil energy technologies with enhancement of natural sinks, (5) develop innovative technologies that produce valuable commodities from CO₂, and (6) incorporate carbon sequestration processes into advanced energy production and utilization systems.

The Department of Energy is soliciting applications for carbon sequestration research and development activities related to the key program elements described in the Federal Energy Technology Center's (FETC) Carbon Sequestration Program, available on the FETC web site at www.fetc.doe.gov/products/gcc. These elements stem directly from the ***Carbon Sequestration: State of the Science*** report, which is available from the Office of Fossil Energy's web site at www.fe.doe.gov/sequestration.

The Office of Science has recently formed two new centers for Carbon Sequestration Research as part of the “Carbon Management Science Program.” The Center for Terrestrial Carbon Sequestration, led by Oak Ridge National Laboratory, will develop the scientific understanding to evaluate the feasibility of environmentally sound strategies for enhancing carbon sequestration in terrestrial ecosystems. The challenge is to determine how to increase, for instance, carbon sequestration in forests, crops, and grasslands without significantly diminishing, and perhaps even increasing, forest and crop yield and other desirable ecosystem goods and services.

The Center for Ocean Sequestration, headed up by Lawrence Berkeley and Lawrence Livermore National Laboratories, will address (1) enhancing sequestration through fertilization of the ocean with nutrients and (2) direct injection of CO₂ into the deep ocean. Research by Center scientists will address understanding of the long-term effectiveness of ocean carbon sequestration as well as the potential effects of ocean sequestration on the biosphere and natural biogeochemical activity.

The FETC Carbon Sequestration Program seeks to build on, collaborate with, and apply basic research activities being conducted in the Office of Science's Carbon Management Science Program. The Offices of Fossil Energy and Science are embarking on a carbon sequestration technology development road mapping effort to further define research pathways identified in the **State of the Science** draft report and collaborating on developing technology assessment methodologies. The goal of both programs is to conduct the full spectrum of necessary R&D to define the potential of carbon sequestration as a major tool for managing carbon emissions.

Topic Areas of Interest

Proposers may submit research applications for any topic area, for more than one topic area, and for research activities that encompass more than one topic area. An example of an application encompassing more than one topic area could involve both capture and use of CO₂. Separate applications for each respective topic area must be submitted if an applicant desires to submit proposals for more than one topic area. The applicant shall clearly mark on the coversheet of the application the topic area of interest.

A. Separation and Capture

Before CO₂ gas can be sequestered from point sources, it must be captured as a relatively pure gas. On a mass basis, CO₂ is the 19th largest commodity chemical in the United States, and CO₂ is routinely separated and captured as a by-product from industrial processes such as synthetic ammonia production, H₂ production, and limestone calcination.

However, existing capture technologies are not cost-effective when considered in the context of CO₂ sequestration. Analysis performed by SFA Pacific, Inc. indicates those adding existing technologies for CO₂ capture to an electricity generation process increase the cost of electricity by 2.5 cents to 4 cents/kWh depending on the type of process. Further, carbon dioxide capture is generally estimated to represent three-fourths of the total cost of a carbon capture, storage, transport, and sequestration system.

The objectives include the reduction of both the capital and energy costs associated with CO₂ capture and separation from large point sources. Opportunities for significant cost reductions exist since very little R&D has been devoted to CO₂ capture and separation technologies. This topic area focuses on research activities that lead to evolutionary improvements in existing CO₂ capture systems and also explore revolutionary new capture and separation concepts. Several innovative schemes have been proposed that could significantly reduce CO₂ capture costs, compared to conventional processes. Fossil fuel energy systems that integrate utilization with CO₂ separation and capture and "one box" concepts that combine CO₂ capture with reduction of criteria-pollutant emissions are also desired.

The Department of Energy is interested in receiving applications for research to significantly reduce both the capital and energy penalty costs of separating and capturing CO₂ from fossil energy production and utilization systems.

B. Sequestration of CO₂ in Geologic Formations

CO₂ sequestration in geologic formations includes oil and gas reservoirs, unmineable coal seams, and deep saline reservoirs. The objectives of this topic area include mechanistic studies, field tests and verification of storage of CO₂ in these geological formations.

Oil and gas reservoirs. In some cases, production from an oil reservoir can be enhanced by pumping CO₂ gas into the reservoir to push out the product, in a process which is called enhanced oil recovery (EOR). Although the low market price for oil and natural gas has limited the incentives for such measures, the United States is the world leader in EOR technology, using about 32 million tons of CO₂ per year for this purpose.

From the perspective of the Sequestration Program, EOR represents an opportunity to sequester carbon at low net cost, due to the revenues from recovered oil/gas. In an EOR application, the integrity of the CO₂ that remains in the reservoir is well understood and retention is very high, as long as the original pressure of the reservoir is not exceeded. Monitoring and verification methodologies that determine the fate and amount of CO₂ retained in the formation after EOR operations are completed are needed. Assessment tools that could be used to optimize CO₂ storage and predict the potential for CO₂ sequestration are also desirable. EOR represents an exciting opportunity for near-term, lowcost sequestration.

The Department of Energy is interested in receiving applications that determine the amount of CO₂ sequestered in EOR applications, including monitoring and verification. Applications that involve advancing or applying existing EOR methodologies for oil production are not sought in this program solicitation and will be considered nonresponsive.

Coal Bed Methane. Some coal beds contain large amounts of methane-rich gas that is adsorbed onto the surface of the coal. The current practice for recovering coal bed methane (CBM) is to depressurize the bed, usually by pumping water out of the reservoir. An alternative approach is to inject carbon dioxide gas into the bed. Tests have shown that CO₂ is roughly twice as adsorbing on coal as methane, giving it the potential to efficiently displace methane and remain sequestered in the bed. Similar to the by-product value gained from EOR, the recovered methane provides a value-added revenue stream to the carbon sequestration process, creating a low net cost option.

Work is needed to develop better estimates of the potential capacity of cost-effective coal bed sequestration in the United States, although the capacity is potentially high. The U.S. coal resources are estimated at six trillion tons, and 90 percent of the resources is unmineable due to seam thickness, depth, and structural integrity. Another promising aspect of CO₂ sequestration in coal beds is that many of the large unmineable coal seams are near electricity-generation facilities that are large point sources of CO₂ gas. Thus, limited pipeline transport of CO₂ gas would be required.

Saline Formations. Sequestration of CO₂ in deep saline formations does not produce value-added by-products, but has other advantages. First, the estimated carbon storage capacity of saline formations in the United States is large, making them a viable long-term solution. Second, most existing large CO₂ point sources are within easy access to a saline formation injection point (no pipelines required), and therefore sequestration in saline formations is compatible with a strategy of transforming large portions of the existing U.S. energy and industrial assets to near-zero carbon emissions via low cost carbon sequestration retrofits.

Assuring the environmental acceptability and safety of CO₂ storage in saline formations is a key component of this program element. Determining that CO₂ will not escape from formations and migrates up to the earth's surface or into other formations is a key aspect of sequestration research. The main thrust of this topic area is centered around research and field testing to develop the capability to predict the stability of CO₂ within saline formations. Other key objectives are to determine the degree to which the CO₂ stays sequestered in the formations and to assess any long-term ecological impacts.

The Department of Energy is also interested in receiving applications ranging from fundamental investigations into defining the characteristics of coals that enhance CO₂ absorption and storage in coal seams and increasing the understanding of the interaction of CO₂ with minerals in saline reservoir formations, through field testing of coal seam and saline reservoir CO₂ sequestration concepts. Field-testing activities should include monitoring and verification of the CO₂ sequestered. Research applications responsive to this topic area should also include the development of methodologies to assess and predict the long-term viability of sequestration of CO₂ in geological structures.

Research conducted in this topic area must provide the necessary scientific data to identify and resolve potential environmental issues concurrently with technology development activities to ensure that geological sequestration will not create adverse environmental legacies in the future.

C. Ocean Sequestration

CO₂ is soluble in ocean water, and through natural processes the oceans both absorb and emit huge amounts of CO₂ into the atmosphere. On balance, however, the oceans are net absorbers. It is widely believed that the oceans will eventually absorb most of the CO₂ in the atmosphere above the pre-industrial level of 288 ppm. However, the mass transfer from the atmosphere to the ocean is unacceptably slow, allowing a peak in atmospheric CO₂ concentration of several hundred years.

The objectives of this topic area include identifying the costs, environmental acceptability and effectiveness of sequestering CO₂ in the oceans. Technology exists for the direct injection of CO₂ into deep areas of the ocean; however, the knowledge is not adequate to optimize the costs, determine the effectiveness of the sequestration, and understand the resulting changes in the biogeochemical cycles of the ocean. Also, a better understanding of the ecological impact of injecting CO₂ into the deep ocean is needed.

To assure environmental acceptability, developing a better understanding of the ecological impacts of both ocean fertilization, adding nutrients to ocean surface waters to stimulate the growth of phytoplankton which regulate the carbon flux between the atmosphere and the oceans, and direct injection of CO₂ into the deep ocean is a primary focus of the Center for Ocean Carbon Sequestration in the Office of Science. It is known that small changes in biogeochemical cycles may have large consequences, many of which are secondary and difficult to predict. Of particular concern is the effect of CO₂ on the pH of ocean water. Information on changes to ocean chemistry will be used to predict the effect of sustained releases of CO₂ on the biogeochemistry and natural ecosystems.

The Department of Energy is interested in receiving research applications that develop and optimize systems to deliver CO₂ to injection sites and potential nutrients for dispersal in the ocean, reliable estimates of the cost and effectiveness of ocean sequestration, and concepts for converting CO₂ to other forms (e.g., carbonates, clathrates) that are stable in the ocean or on the ocean floor.

D. Carbon Sequestration in Terrestrial Ecosystems (Soils and Vegetation)

Enhancing the natural processes that remove CO₂ from the atmosphere is thought to be one of the most cost-effective means of reducing atmospheric levels of CO₂. Reforestation and deforestation abatement efforts are already under way. This topic area is focused on integrating measures for improving the full life-cycle carbon uptake of terrestrial ecosystems, including farmland and forests, with fossil fuel production and use.

This program element will be conducted in collaboration with the DOE Office of Science, the U.S. Forest Service and other elements of the U.S. Department of Agriculture, and other national and international entities. The Office of Science Center for Terrestrial Sequestration research activities includes enhancing carbon sequestration through landscape management, partitioning the carbon into longer-lived plants and soils, and enhancing the storage of carbons in living plant biomass.

Examples of activities for this program element include, but are not limited to:

- Facilitate partnerships between energy producers (e.g., coal companies, utilities), land owners, biomass and biofuels industries, and government agencies such as the U.S. Forestry Service to determine approaches to increase carbon sequestration in soils and vegetation to lower the overall carbon dioxide emission intensity of producing or using fossil fuels
- Provide comprehensive evaluations and assessments of the full life-cycle costs associated with integrated energy production and utilization with enhanced terrestrial sinks

The Department of Energy is interested in research applications aimed at developing innovative and advanced concepts that integrate energy production and utilization with approaches to enhance natural terrestrial sinks. Applications that only involve coal and biomass and/or waste cofiring will not be considered responsive to this program solicitation. These activities are being carried out elsewhere in the Department of Energy.

E. Advanced Concepts (Chemical, Biological, And Other Approaches)

Recycling or reuse of CO₂ from energy systems would be an attractive alternative to storage of CO₂. The goal of this topic area is to reduce the cost and energy required to chemically and/or biologically convert CO₂ into either commercial products, or stable compounds that are inert and long-lived.

Objectives include the development of novel chemical reaction pathways and biological systems that enable CO₂ to be converted to useful products or chemical species that are more easily stored.

Concerning biological systems, incremental enhancements to the carbon uptake of photosynthetic systems could have a significant positive effect. Also, harnessing naturally occurring, nonphotosynthetic microbiological processes capable of converting CO₂ into useful forms, such as methane and acetate, could represent a technology breakthrough. An important advantage of biological systems is that they do not require pure CO₂ and do not incur costs for separation, capture, and compression of CO₂ gas.

Examples of research activities in this topic area include, but are not limited to:

- Advanced catalysts for CO₂ or CO conversion
- Biomimetic systems
- Novel solvents, sorbents, membranes and thin films for gas separation
- Biological systems
- Nonphotosynthetic mechanisms for CO₂ fixation (methanogenesis and acetogenesis)

The Department of Energy is interested in receiving research applications to develop novel and advanced concepts for capture, reuse, and storage of CO₂ and other greenhouse gases (GHGs) from energy production and utilization systems.

F. Modeling and Assessments

Better assessments of the costs, risks, and the potential of carbon sequestration technology are essential to develop technological options for greenhouse gas mitigation. Barriers to the implementation of proposed schemes must be identified and evaluated. Sound assessment capabilities are required to evaluate technological options in a total systems context, considering costs and impacts over a full product cycle, and societal and environmental effects to provide a basis for assessing tradeoffs between local environmental impacts and global impacts.

Analytical tools are needed to strategically select the most promising R&D efforts that have high potential, but significant uncertainties, associated with their costs and effectiveness. Simple transparent templates and worksheets to screen such efforts are desired. Examples of the use of such techniques are contained in the following two papers and can be acquired by contacting Elsevier Science Customer Support Department, P.O. Box 945, New York, NY 10010, USA or at E-mail: usinfo-f@elsevier.com. They are a part of "Carbon Dioxide Removal, Proceedings of the Third International Conference on Carbon Dioxide Removal."

1. Audus, H. and H. Oonk. An assessment procedure for chemical utilization schemes intended to reduce CO₂ emissions to the atmosphere. Proceedings of the Third International Conference on Carbon Dioxide Removal, pp. 409-414. Pergamon Press. Cambridge, Mass, September 9-11, 1996.

2. Simbeck, D. A portfolio selection approval for power plant CO₂ capture, separation, and R and D Options. Proceedings of the Fourth International Conference on Carbon Dioxide Removals, pp. 119-124. Pergamon Press, August 30-September 2, 1998, Interlaken, Switzerland.

The Department of Energy is interested in receiving research applications to develop appropriate models and assessment capabilities to assess the status and risk of sequestration technologies, sequestration guidelines integrated with monitoring methods to ensure environmental conformity and public acceptance, and to evaluate advanced GHG sequestration and utilization concepts on the same basis determining their sequestration potential and carbon emissions avoided at net costs.

INSTRUCTIONS

(This form shall be completed in accordance with the following instructions. For any clarification or additional information that might be needed, consult the appropriate section of the DOE Financial Assistance Procedures Manual (DOE-FAPM).)

Insert in the space provided, in the line which begins, "Under the Authority of Public Law ...," the number and the name of the Public Law which authorizes this award. On the line below, enter the title of the pertinent program.

Block 1 — Enter the project title as it appears in the SF-424 or equivalent application/proposal face sheet.

Block 2 — Place a checkmark in the box beside the appropriate financial assistance instrument.

Block 3 — Enter the name, address, and telephone number of the applicant/proposer as it appears in the SF-424 or equivalent application/proposal face sheet.

Block 4 — Enter the instrument number. (See DOE-FAPM.)

Block 5 — Enter the appropriate amendment number. (See DOE-FAPM for guidance.)

Block 6 — Enter the starting date and expiration date for the current budget period. If a budget period is being changed, enter the starting date and expiration date for the budget period, as changed.

Block 7 — Enter the starting date and anticipated completion date for the project. If a project period is being changed, enter the starting date and anticipated completion date for the project period, as changed.

Block 8 — Enter the name and telephone number of the individual designated by the applicant/proposer as the director of the project.

Block 9 — Enter the name and telephone number of the individual designated by the applicant/proposer as the contact for all business matters.

Block 10 — Place a checkmark in the box opposite the term which identifies the type of action being taken. (The terms are defined in the DOE-FAPM.)

Block 11 — Enter the name, address, and telephone of the individual designated by the DOE program office as the project officer.

Block 12 — Enter the name, address, and telephone number of the individual/organization who will administer the agreement for DOE.

Block 13 — Place a checkmark in the box beside the applicable recipient type. If the recipient is a for-profit organization, also check one of the lower boxes as follows: "C" for Corporation, "P" for Partnership, and "SP" for Sole Partnership. If the recipient is of a type not indicated, place a checkmark in the box beside "Other," and identify the recipient type in the space provided.

Block 14 — Enter where indicated, the appropriation symbol, B&R number, Fund Type (FT)/AFP Code (AFP)/Objective Class (OC) and CFA Number from the Procurement/Financial Assistance Request Authorization (DOE Form PR-799A). Completion Block 14.d. is required only for awards made by Headquarters.

Block 15 — Enter the applicant's/proposer's Federal Employer Identification No. from the SF-424 or equivalent application/proposal face sheet, or if the applicant/proposer is an individual, enter his/her social security number.

Block 16 — Entries should be made as follows. (If no dollar entry is appropriate, a zero should be entered to indicate there was no error of omission.)

Line a.(1) — Enter the amount of DOE funds obligated by this action.

Line a.(2) — Enter the amount of DOE funds not expended in prior budget period(s), if any, authorized by DOE for expenditure in the current budget period.

Line a.(3) — Enter the amount of DOE funds previously obligated in the current budget period.

Line a.(4) — Enter DOE's share of the total approved budget shown in Line a.(6).

Line a.(5) — Enter the recipient's share of the total approved budget shown on Line a.(6).

Line a.(6) — Enter the total approved budget for the current budget period. (Add the amounts in Lines a.(4) and a.(5).)

Line b.(1) — Enter the amount of DOE funds obligated in the current budget period. (Add the amounts in Lines a.(1) and a.(3).)

Line b.(2) — Enter the amount obligated by DOE in prior budget periods.

Line b.(3) — Enter the amount obligated by DOE in the project period to date. (Add the amounts in Lines b.(1) and b.(2).)

Block 17 — Must be completed for cooperative agreements. Contracting Officers may exercise discretion as to whether to complete it for grants. Enter the blank provided, the amount which represents the current estimate of total funds and dollar value of in-kind contributions (both DOE and recipient shares) needed to carry out the entire project. Include all funds and contributions previously provided, those being provided by this action, and all anticipated future obligations and contributions of both parties.

Block 18 — Complete as follows.

Item a. — No entry necessary.

Item b. — Enter the legal citation from the Code of Federal Regulations or Federal Register and the effective date for the program regulations applicable to the program under which the award is made.

Item c. — Mark the box beside B for grants or C for cooperative agreements.

Item d. — In the blank provided, enter the date of the application/proposal. (If SF-424 is used, see block 23c on page 1.) Place a checkmark in the appropriate box to indicate whether the application/proposal was accepted as submitted or with negotiated changes.

Block 19 — Enter any explanation or advisory comments which are required for, or applicable to, this action.

Block 20 — Will be completed by the recipient.

Block 21 — The Contracting Officer shall sign and date the top line. His/her name and title should be entered on the next two lines. This box must be signed prior to forwarding to recipient.

SECTION II -- SPECIAL TERMS AND CONDITIONS

2.1 CONSECUTIVE NUMBERING (JAN 1999)

Due to automated procedures employed in formulating this document, clauses and provisions within it may not always be continuously numbered.

2.2 PREVAILING REGULATIONS (NOV. 1998)

As indicated on the face page, Block 18c, this Award is subject to the DOE Assistance Regulations of Title 10, Code of Federal Regulations, Part 600. This set of regulations may be found in most major libraries or on the World Wide Web at:

<http://www.pr.doe.gov/fahome.html>

2.3 ORDER OF PRECEDENCE (MAY 1999)

In the event of any inconsistency among the provisions of this agreement, the inconsistency shall be resolved by giving precedence as follows: (a) Applicable Public Laws; (b) 10 CFR Part 600; (c) the special terms and conditions or a schedule of articles; and (d) other documents, exhibits and attachments.

2.4 SUBSTANTIAL INVOLVEMENT BETWEEN DOE AND THE RECIPIENT (JAN 1999)

There will be substantial involvement between the DOE and the Recipient during performance of this Cooperative Agreement. The DOE will participate in establishing and approving a work plan, which will identify essential and significant milestones necessary for completion of the project. This work plan will be used to determine whether or not to proceed with subsequent tasks of the Statement of Project Objectives.

2.5 COST SHARING (NOV 1998)

[TBD]

2.6 FUNDING (JULY 1999)

Funding in the amount of [TBD] is obligated and made available for payment of the Government's share of allowable costs.

The Recipient shall promptly notify the Contracting Officer in writing of the estimated amount of additional funds, if any, are required to continue timely performance under this award and when the funds will be required. The maximum DOE obligation to the Recipient is shown in Block 16 of the DOE Form 4600.1. The Government is not obligated to increase the total dollar amount funded and the Recipient is not obligated to continue performance under this award or otherwise incur costs to the extent that the Government's share of allowable costs would exceed the amount obligated by the Government.

2.7 CONTINUATION APPLICATION (MAY 1999)

Funding for each budget period within the approved project period shall be contingent on DOE approval of a continuation application submitted no later than 60 days prior to the end of the current budget period. The continuation application shall be submitted on the SF 424 in accordance with 10 CFR 600.26. Forms for submission of continuation applications can be found at

<http://www.fetc.doe.gov/business/forms/forms.html>

2.8 METHOD OF PAYMENT - PAYMENT MANAGEMENT SYSTEM (PMS) 10 CFR 600.122 (NOV 1998)

Payment Management System (PMS): The Recipient is required to maintain advances of federal funds in interest bearing accounts. Any interest income earned by the Recipient on federal funds must be remitted at least quarterly to the cognizant DOE office. However, up to \$250 of the interest earned per year may be retained by the Recipient to cover administrative expenses.

Funds advanced to the Recipient must be kept to a minimum amount necessary to meet the Recipient's cash flow needs. Cash needs shall be determined by the Recipient's cash outlay requirements and shall not be based on costs incurred. If funds are erroneously drawn in excess of the Recipient's immediate disbursement needs, the excess funds should be promptly refunded and reissued when needed. The only exception to this

is when excess funds will be disbursed by the Recipient within seven calendar days or when the excess funds are less than \$10,000 and will be disbursed within thirty (30) calendar days.

A computer generated report (PMS 272 -- Federal Cash Transaction Report, Status of Federal Cash) will be furnished by the Department of Health and Human Services (DHHS) to all Recipients on a quarterly basis with active PMS accounts. The Recipient will be required to review the report and certify that the data is correct. In addition to returning the certified report to the DHHS, a copy of the report should be sent to the cognizant Contracting Officer. Unsigned reports will be returned and may cause delays in payment if the report due date has passed.

A detailed statement of costs incurred and the cost sharing amount shall be forwarded to the Contracting Officer concurrent with drawdowns from the PMS.

2.9 ACKNOWLEDGMENT OF FEDERAL FUNDING (NOV 1998)

When issuing statements, press releases, requests for proposals, bid solicitations, and other documents describing this project, the Recipient shall clearly state (1) the percentage of the total cost of the project which will be financed with Federal money, and (2) the dollar amount of Federal funds for the project.

2.10 REAL PROPERTY - NONE (JAN 1999)

No real property may be acquired under this award.

2.11 RECIPIENT ACQUIRED PROPERTY (MAY 1999)

Reference Attachment D for a listing of property authorized for acquisition under this award. Property acquired by the Recipient under this award shall be managed in accordance with 10 CFR 600.130 to 10 CFR 600.137, and reported as prescribed in Attachment B, Federal Assistance Reporting Checklist.

2.12 KEY PERSONNEL (NOV 1998)

Recipient personnel considered to be essential and key to the work being performed hereunder are specified below.

<u>NAME</u>	<u>TITLE</u>	<u>TELEPHONE</u>
[TBD]	[TBD]	[TBD]

The personnel specified in this clause are considered to be essential to the project. Before diverting any key personnel to work outside the scope of this award, the Recipient shall notify the Contracting Officer reasonably in advance and shall submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on the project. No key personnel may be substituted without the Contracting Officer's approval. Such approval shall be obtained in advance of the substitution, except that the Contracting Officer may ratify a substitution which, because of exigent circumstances, was made before the Recipient could request and/or obtain the Contracting Officer's approval.

2.13 PAPERWORK REDUCTION (NOV 1998)

The award is subject to the requirements of the Paperwork Reduction Act of 1980 as implemented by the Office of Management and Budget rules, "Controlling Paperwork Burdens on the Public," published at 5 CFR 1320. These requirements apply if the Recipient will collect information from ten (10) or more respondents at the specific request of DOE, or if the award requires specific DOE approval of the information collection or the collection procedures.

The Recipient shall submit any proposed-sponsored information collection to the person identified on the DOE F 4600.1 (Award Face Page, Block 12). The proposal shall be submitted at least 120 days prior to the intended date of information collection. DOE will seek the requisite approval from the Office of Management and Budget (OMB) and will promptly notify the Recipient of the disposition of the request.

2.14 NONDISCRIMINATION (NOV 1998)

This award is subject to the provisions of 10 CFR 1040, "Nondiscrimination in Federally Assisted Programs."

2.15 PUBLIC ACCESS TO INFORMATION (JULY 1999)

The Freedom of Information Act, as amended, and the DOE implementing regulations (10 CFR 1004) require DOE to release certain documents and records regarding awards to any person who provides a written request. The intended use of the information will not be a criterion for release. These requirements apply to information held by DOE and do not require Recipients, their subgrantees, or their contractors to permit public access to their records.

2.16 NATIONAL SECURITY (NOV 1998)

It is not expected that activities under the award will generate or otherwise involve classified information (i.e., Restricted Data, Formerly Restricted Data, National Security Information).

However, if in the opinion of the Recipient or DOE such involvement becomes expected prior to the closeout of the award, the Recipient or DOE shall notify the other in writing immediately. If the Recipient believes any information developed or acquired may be classifiable, the Recipient shall not provide the potentially classifiable information to anyone, including the DOE officials with whom the Recipient normally communicates, except the Director of Classification, and shall protect such information as if it were classified until notified by DOE that a determination has been made that it does not require such handling. Correspondence which includes the specific information in question shall be sent by registered mail to U. S. Department of Energy, Attn.: Executive Assistant for Defense Programs, DP-4, 4A-019/FORS, 1000 Independence Avenue, Washington, D.C. 20585. If the information is determined to be classified, the Recipient may wish to discontinue the project, in which case the Recipient and DOE shall terminate the award by mutual agreement. If the award is to be terminated, all materials deemed by DOE to be classified shall be forwarded to DOE, in a manner specified by DOE, for proper disposition. If the Recipient and DOE wish to continue the award, even though classified information is involved, the Recipient shall be required to obtain both personnel and facility security clearances through the Office of Safeguards and Security for Headquarters awarded awards obtained through DOE field organizations. Costs associated with handling and protecting any such classified information shall be negotiated at the time the determination to proceed is made.

2.17 COMPLIANCE WITH BUY AMERICAN ACT (DEC 1998)

In accepting this award, the Recipient agrees to comply with sections 2 through 4 of the Act of March 3, 1933, (41 U.S.C. 10a-10c, popularly known as the "Buy American Act"). The Recipient should review the provisions of the Act to ensure that expenditures made under this award are in accordance with it.

2.18 NOTICE REGARDING THE PURCHASE OF AMERICAN-MADE EQUIPMENT AND PRODUCTS -- SENSE OF CONGRESS (NOV 1998)

It is the sense of the Congress, that to the greatest extent practicable, all equipment and products purchased with funds made available under this award should be American-made.

2.19 LOBBYING RESTRICTION (DEPARTMENT OF INTERIOR & RELATED AGENCIES APPROPRIATIONS ACT, 1999) (JUNE 1999)

The contractor or awardee agrees that none of the funds obligated on this award shall be made available for an activity or the publication or distribution of literature that in any way tends to promote public support or opposition to any legislative proposal on which Congressional action is not complete. This restriction is in addition to those prescribed elsewhere in statute and regulation.

A copy of the DOE "Lobbying Brochure" which provides a summary of the statutory and regulatory restrictions regarding lobbying activities for Federal contractors can be found at <http://www.pr.doe.gov/lobbying.html>.

2.20 NOTICE REGARDING UNALLOWABLE COSTS AND LOBBYING ACTIVITIES (NOV 1998)

Recipients of financial assistance are cautioned to carefully review the allowable cost and other provisions applicable to expenditures under their particular award instruments. If financial assistance funds are spent for purposes or in amounts inconsistent with the allowable cost or any other provisions governing expenditures in an award instrument, the government may pursue a number of remedies against the Recipient, including in appropriate circumstances, recovery of such funds, termination of the award, suspension or debarment of the Recipient from future awards, and criminal prosecution for false statements.

Particular care should be taken by the Recipient to comply with the provisions prohibiting the expenditure of funds for lobbying and related activities. Financial assistance awards may be used to describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not to encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

2.21 YEAR 2000 COMPLIANCE (NOV 1998)

Year 2000 compliant means, with respect to information technology, the information technology accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap year calculations, to the extent that other information technology, used in combination with the information technology being acquired, properly exchanges date/time data with it.

The Recipient assures, by acceptance of this award, that items delivered under this contract are year 2000 compliant.

2.22 REPORTING (NOV 1998)

Failure to comply with the reporting requirements contained in this award will be considered a material noncompliance with the terms of the award. The noncompliance may result in a withholding of future payments, suspension or termination of the current award, and withholding of future awards. A willful failure to perform, or of unsatisfactory performance of this and/or other financial assistance awards, may also result in a debarment action to preclude future awards by Federal agencies.

2.23 RESEARCH INVOLVING RECOMBINANT DNA MOLECULES (NOV 1998)

Any Recipient performing research involving recombinant DNA molecules and/or organisms and viruses containing recombinant DNA molecules agrees by acceptance of this award to comply with the National Institute of Health "Guidelines for Research Involving Recombinant DNA Molecules," 59 FR 34496, July 5, 1994 as amended by 59 FR 40170, 60 FR 20726, 61 FR 1482, 61 FR 10004, 62 FR 53335, 62 FR 56196, 62 FR 59032 and 63 FR 8052, "subject to change - call 301-496-9838 to obtain reference to a current version."

2.24 LIMITATION ON EXPENDITURES (FEB 1999)

The National Environmental Policy Act of 1969 (NEPA) requires that all Federal agencies consider the impacts of their projects on the human environment. As part of the DOE's NEPA requirements, the Recipient shall be required to supply DOE certain environmental information. DOE funds may only be expended by the Recipient on [Insert] activities, until DOE notifies the Recipient that all NEPA requirements have been satisfied. The Recipient, however, may expend its funds at its own risk for performance of other activities under this award.

2.25 SAFETY & HEALTH AND ENVIRONMENTAL PROTECTION (JAN 1999)

The Recipient shall implement the DOE work in accordance with all applicable Federal, State, and local laws, including codes, ordinances, and regulations, covering safety, health, and environmental protection.

The Recipient agrees to include this clause in first-tier subcontracts and agrees to enforce the terms of this clause.

2.26 PERMITS AND LICENCES (JAN 1999)

Within sixty (60) days of award, the Recipient shall submit to the DOE Contracting Officer Representative (COR) a list of environmental safety and health approvals that, in the Recipients opinion, shall be required to complete the work under this Award. The list shall include the topic of the approval being sought, the approving authority, and the expected submittal/approval schedule. The COR shall be notified as specific items are added or removed from the list and processed through their approval cycles.

The Recipient agrees to include this clause in first-tier subcontracts and agrees to enforce the terms of this clause.

SECTION III -- INTELLECTUAL PROPERTY PROVISIONS

3.1 INTELLECTUAL PROPERTY PROVISIONS (JAN 1999)

The patent and technical data clauses included in this section apply to this award. As used in these applicable clauses, the term "Patent Counsel" refers to the following point of contact:

Intellectual Property Law Division
U.S. Department of Energy
Chicago Operations Office
9800 South Cass Avenue
Argonne, IL 60439

In any of the FAR and DEAR clauses contained in this section, use of the term "Contract" means "Award" and "Contractor" means "Recipient."

The Recipient shall include intellectual property clauses in any contract awarded in accordance with requirements of the clauses in this section and of 10 CFR Part 600.27.

3.2 PUBLICATION OF RESULTS/ACKNOWLEDGMENT STATEMENT (JAN 1999)

Publication of the results of the award is encouraged subject to any applicable restrictions in 10 CFR 600.27 (Patent and Data Provisions). Publications, as well as reports prepared under this Award shall contain the following acknowledgment statement:

"This (describe material) was prepared with the support of the U.S. Department of Energy (DOE), under Award No. DE-[]. However, any opinions, findings, conclusions, or recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of the DOE."

3.3 RECIPIENT PRESS RELEASES (APR 1998)

The DOE policy and procedure on planned press releases require that all Recipient press releases be reviewed and approved by DOE prior to issuance. Therefore, the Recipient shall, at least ten (10) days prior to the planned issue date, submit a draft copy to the Contracting Officer of any planned press releases related to work performed under this award. The Contracting Officer will then obtain necessary reviews and clearances and provide the Recipient with the results of such reviews prior to the planned issue date.

3.4 CONFIDENTIAL BUSINESS INFORMATION (NOV 1998)

Data represented to the Department as being confidential business information, and which does not include Technical Data as that term is defined in the Rights in Technical Data clause of this agreement, shall be submitted as an attachment to the required reports and will be withheld from disclosure outside FETC to the extent permitted by law, provided such attachment and each page therein is stamped with the following legend and no other:

CONFIDENTIAL BUSINESS INFORMATION

The Recipient considers the data furnished herein to contain confidential business information which is to be withheld from disclosure outside FETC to the extent permitted by law.

3.5 CLAUSES INCORPORATED BY REFERENCE (AUG 1999)

This solicitation incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

Federal Acquisition Regulations (FAR) (Clauses starting with 52):
<http://www.armet.gov/far/index.html>

Department of Energy Acquisition Regulations (DEAR) (Clauses starting with 952)
<http://www.pr.doe.gov/dear.html>

3.6 52.227-1 AUTHORIZATION AND CONSENT. (JUL 1995) -- ALTERNATE I (APR 1984)

3.7 52.227-2 NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT. (AUG 1996)

3.8 952.227-9 REFUND OF ROYALTIES. (MAR 1995)

3.9 952.227-11 PATENT RIGHTS-RETENTION BY THE CONTRACTOR (SHORT FORM). (FEB 1995)

3.10 952.227-13 PATENT RIGHTS-ACQUISITION BY THE GOVERNMENT. (SEP 1997)

3.11 FAR 52.227-14 RIGHTS IN DATA (JUN 1987) WITH ALTERNATE V (JUN 1987) AS AMENDED BY DEAR 927.409 (JAN 1999)

3.12 FAR 52.227-14 RIGHTS IN DATA GENERAL. (JUN 1987) ALTERNATE II (JUN 1987)

3.13 FAR 52.227-14 RIGHTS IN DATA GENERAL. (JUN 1987) ALTERNATE III (JUN 1987)

3.14 FAR 52.227-14 RIGHTS IN DATA GENERAL. (JUN 1987) ALTERNATE IV (JUN 1987)

3.15 52.227-16 ADDITIONAL DATA REQUIREMENTS. (JUN 1987)

3.16 52.227-23 RIGHTS TO PROPOSAL DATA (TECHNICAL). (JUN 1987)

SECTION IV -- LIST OF ATTACHMENTS

4.1 LIST OF ATTACHMENTS (JAN 1999)

Attachment A -- Statement of Project Objectives

Attachment B -- Federal Assistance Reporting Checklist

Attachment C -- Budget Page(s)

Attachment D -- Recipient Acquired Property

Attachment E -- Federally Owned Property -- Government Furnished

4.2 ATTACHMENT A -- STATEMENT OF PROJECT OBJECTIVES (JAN 1999)

The Statement of Project Objectives will be inserted on this page upon award.

The applicant must prepare the Statement of Project Objectives and include it as an Appendix to Volume II -Technical Application. Instructions for preparation of this document can be found in Section VI.

**U.S. DEPARTMENT OF ENERGY
Federal Energy Technology Center**

FEDERAL ASSISTANCE REPORTING CHECKLIST

1. AWARDEE:	2. IDENTIFICATION NUMBER:
--------------------	----------------------------------

3. REPORT SUBMISSION ADDRESS: *The requested quantity of all required report deliverables shall be submitted to the following address:*
**FETC AAD DOCUMENT CONTROL BLDG. 921
U.S. DEPARTMENT OF ENERGY
FEDERAL ENERGY TECHNOLOGY CENTER
P.O. BOX 10940
PITTSBURGH, PA 15236-0940**

4. PLANNING AND REPORTING REQUIREMENTS:	FORM NO.	FREQ.	NUMBER OF COPIES
A. PROGRAM/PROJECT MANAGEMENT			
<input type="checkbox"/> Federal Assistance Milestone Plan	DOE F 4600.3		
<input type="checkbox"/> Milestone Log	DOE F 4600.3A		
<input type="checkbox"/> Federal Assistance Management Summary Report	DOE F 4600.5		
<input checked="" type="checkbox"/> Federal Assistance Program/Project Status Report	DOE F 4600.6	Q	2
<input checked="" type="checkbox"/> Financial Status Report	SF-269 or SF-269A	Q	3
<input type="checkbox"/> Federal Cash Transaction Report	SF-272		
B. TECHNICAL (One paper copy and one PDF electronic file copy)			
<input checked="" type="checkbox"/> Technical Progress Report	None	Y	2
<input checked="" type="checkbox"/> Topical Report	None	A	2
<input checked="" type="checkbox"/> Final Report	None	F	2
C. ENVIRONMENTAL			
<input checked="" type="checkbox"/> Hazardous Substance Plan	None	O	3
<input checked="" type="checkbox"/> Hazardous Waste Report	None	F	3
<input type="checkbox"/> Environmental Compliance Plan	None		
<input type="checkbox"/> Environmental Monitoring Plan	None		
<input type="checkbox"/> Environmental Status Report	None		
D. PROPERTY			
<input type="checkbox"/> Annual Report of Property in the Custody of Contractors	F 580.1-8		
<input type="checkbox"/> High Risk Property Report	F 4440.5		
<input checked="" type="checkbox"/> Report of Termination or Completion Inventory	SF-1428 or SF-120	FC	1
E. EXCEPTION			
<input type="checkbox"/> Conference Record	None		
<input checked="" type="checkbox"/> Hot Line Report	None	A	2
<input checked="" type="checkbox"/> Journal Articles/Conference Papers and Proceedings	None	A	2
<input type="checkbox"/> Software			
<input type="checkbox"/> Other _____			

5. FREQUENCY CODES AND DUE DATES:
A - As required; for due date of Hot Line Report, Property Reports, and all other reports, see attached text.
C - Federal Assistance change/revision, within 15 calendar days after event.
F - Final; within ninety (90) calendar days after the project period ends.
FC - Final (End of Effort - No Draft); end of effort.
M - Monthly; within twenty-five (25) calendar days after end of the report period.
O - Once after award; within thirty (30) calendar days after award.
Q - Quarterly; within thirty (30) calendar days after end of the calendar quarter or portion thereof.
S - Semiannually; within thirty (30) calendar days after end of program half-year.
Y - Yearly; 90 calendar days after the end of calendar year.

6. SPECIAL INSTRUCTIONS:
The forms identified in the checklist are available at <http://www.fetc.doe.gov/business/forms/forms.html>. Alternate formats are acceptable provided the contents remain consistent with the form. All **technical reports** submitted to the DOE **must** be accompanied by a completed and signed **FETC F 2050.4** addressing patent information.

4.4 GENERAL INSTRUCTIONS FOR THE PREPARATION AND SUBMISSION OF REPORTS (MAY 1999)

The Recipient shall prepare and submit (postage prepaid) the plans and reports indicated on the "Federal Assistance Reporting Checklist" to the addressee identified on the checklist. The level of detail the Recipient provides in the plans and reports shall be commensurate with the scope and complexity of the effort and shall be as delineated in the guidelines and instructions contained herein. The prime Recipient shall be responsible for acquiring data from any contractors or subrecipients to ensure that data submitted are compatible with the data elements which prime Recipients are required to submit to DOE.

4.5 FEDERAL ASSISTANCE PROGRAM/PROJECT STATUS REPORT (FORM 4600.6) (MAY 1999)

This report is a concise narrative describing the current status of the effort. The report allows Recipients to communicate developments, achievements, changes and problems. The award Recipient enters a brief narrative discussion of the following topics: approach changes; performance variances, accomplishments, or problems; open times; and status assessment and forecast. Each of these topics is addressed, as appropriate, for a given reporting period and the report is submitted periodically, as required, during the life of the project.

4.6 FINANCIAL STATUS REPORT (STANDARD FORM 269 OR 269A) (MAY 1999)

This report is used for the Recipient to provide regular periodic accounting of project funds expended. The accounting may be on either a cash or accrual basis. Actual total expenditures and obligations incurred, but not paid, are reported for each reporting period for each major activity. They should correlate with those identified on the "Federal Assistance Milestone Plan" when the "Federal Assistance Milestone Plan" is required. Provision is made to identify the Federal and non-Federal share of project outlays for each identified activity.

4.7 TECHNICAL REPORTS (MAY 1999)

CAUTION: Technical reports SHALL NOT include limited rights data (such as restricted, proprietary or patentable information). Limited Rights Data shall be submitted in a separate proprietary appendix to the technical report. This appendix SHALL NOT be submitted in an electronic format but rather submitted in ONE ORIGINAL AND THREE (3) PAPER COPIES along with the paper version of the sanitized technical report deliverable. The appendix shall be referenced in, but not included in, the sanitized technical report deliverable under the contract. In accordance with FAR 52.227-14, Rights in Data-General, the appendix must be appropriately marked and identified.

All TECHNICAL REPORTS submitted to the DOE MUST be accompanied by a completed and signed FETC F 2050.4, addressing patent information.

4.8 TECHNICAL PROGRESS REPORT (ANNUAL, QUARTERLY, AND SEMI-ANNUAL) (MAY 1999)

The body of the report should contain a full account of progress, problems encountered, plans for the next reporting period, and an assessment of the prospects for future progress.

The Technical Progress Report should include sufficient detail to allow the work to be reproduced by others. Results and reduced data shall be presented together with a discussion of the relevance of the findings. When experimental systems and/or procedures are being utilized for the first time, they shall be described in detail. This description shall contain detailed information on equipment and procedures utilized, as well as providing a rationale for their use. All data reduction and transformation methods shall be fully documented. For every fourth calendar quarter for quarterly reports or every second half year for semiannual reports, the report should be expanded to provide for detailed information on the results of the past year, problems encountered, significant accomplishments, listing of publications, presentations, and approaches to be taken the following year.

Informational items in technical progress reports shall include:

Experimental Apparatus -- A comprehensive description, including dimensioned drawings or sketches, of the apparatus and associated diagnostic measurement equipment employed to perform the experimental research.

Experimental and Operating Data -- All experimental data acquired during the course of research including detailed characterization of the sample materials subjected to experimentation.

Data Reduction -- A complete description of the methods employed to transform raw measured data into a form usable for interpretation along with any assumptions or restrictions inherent in the method and the resultant reduced data.

Hypothesis and Conclusions -- Logic for drawing conclusions or developing hypotheses shall be clearly stated along with applicable assumptions or restrictions.

4.9 FINAL TECHNICAL REPORT (MAY 1999)

The Final Report shall document and summarize all work performed during the award period in a comprehensive manner. It shall also present findings and/or conclusions produced as a consequence of this work. This report shall not merely be a compilation of information contained in subsequent quarterly, or other technical reports, but shall present that information in an integrated fashion, and shall be augmented with findings and conclusions drawn from the research as a whole.

The Recipient shall deliver a draft copy of the final report thirty (30) days after completion of the project period. The Government shall be allowed thirty (30) days to review the draft copy and to notify the Recipient, in writing, of approval or recommended changes. If the Government does not approve or recommend changes within thirty (30) days of receipt of the draft copy, the report shall be deemed approved. The approved final report is due ninety (90) days after completion of the project period.

4.10 TOPICAL REPORT (MAY 1999)

These reports usually provide a comprehensive statement of the technical results of the work performed for a specific task or subtask of the Statement of Project Objectives, or detail significant new scientific or technical advances. If required, DOE shall review and approve the report outline prior to submission of the report.

4.11 GUIDELINES FOR ORGANIZATION OF TECHNICAL REPORTS (MAY 1999)

The following sections should be included (as appropriate) in technical reports in the sequence shown. Any section denoted by an asterisk is required in all technical reports.

TITLE PAGE* - The Title Page of the report itself must contain the following information in the following sequence:

- Report Title
- Type of Report (Quarterly, Semi-Annual, Annual, Topical, Final)
- Reporting Period Start Date
- Reporting Period End Date
- Principal Author(s)
- Date Report was Issued (Month [spelled out] and Year [4 digits])
- DOE Award Number (e.g., DE-FG26-99FT12345) and if appropriate, task number
- Name and Address of Submitting Organization (This section should also contain the name and address of significant subcontractors or subrecipients who participated in the production of the report.)

DISCLAIMER* -- The Disclaimer must follow the title page, and must contain the following paragraph:

"This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."

ABSTRACT* - should be a brief, concise summary of the report.

TABLE OF CONTENTS*

LIST(S) OF GRAPHICAL MATERIALS

INTRODUCTION

EXECUTIVE SUMMARY - this should be a well organized summary that highlights the important accomplishments of the research during the reporting period. It should be no less than one page and no more than two pages in length, and should be single spaced. This summary must be more comprehensive than the traditional "abstract."

EXPERIMENTAL* - this should describe, or reference all experimental methods being used for the research. It should also provide detail about materials and equipment being used. Standard methods can be referenced to the appropriate literature, where details can be obtained. Equipment should be described only if it is not standard, or if information is not available thru the literature or other reference publications.

RESULTS AND DISCUSSION* - It is extremely important that this section includes enough relevant data, especially statistical data, to allow the project manager to justify the conclusions. With the relevant data, explain how the data was interpreted and how it relates to the original purpose of the research. Be concise in the discussion on how this research effort solved or contributed to solving the original problem.

CONCLUSION* - The conclusion should not simply reiterate what was already included in the "Results and Discussion" section. It should, however, summarize what has already been presented, and include any logical implications of how the successes are relevant to technology development in the future. This is extremely important, since "relevancy" continues to be a criteria of the program.

REFERENCES*

BIBLIOGRAPHY

LIST OF ACRONYMS AND ABBREVIATIONS

APPENDICES (IF NECESSARY)

Company Names and Logos -- Except as indicated above, company names, logos, or similar material should not be incorporated into reports.

Copyrighted Material -- Copyrighted material should not be submitted as part of a report unless written authorization to use such material is received from the copyright owner and is submitted to DOE with the report.

Measurement Units -- All reports to be delivered under this instrument shall use the SI Metric System of Units as the primary units of measure. When reporting units in all reports, primary SI units shall be followed by their U.S. Customary Equivalents in parentheses ().

The Recipient shall insert the text of this clause, including this paragraph, in all subcontracts under this award.

Note: SI is an abbreviation for "Le Systeme International d'Unites."

4.12 ELECTRONIC MEDIA STANDARD FOR PREPARATION OF TECHNICAL REPORTS (MAY 1999)

FILE FORMAT

Production of high-quality, electronic documents is dependent on the quality of the input that is provided. Thus, the Recipient shall submit one good quality paper copy using either permanent or alkaline paper plus an electronic version of each technical report.

ELECTRONIC REPORTS SHALL BE SUBMITTED IN THE ADOBE ACROBAT PORTABLE DOCUMENT FORMAT (PDF). ELECTRONIC REPORTS SUBMITTED IN A FORMAT OTHER THAN ADOBE WILL BE RETURNED AND THE REPORT CONSIDERED DELINQUENT.

Each report shall be an integrated file that contains all text, tables, diagrams, photographs, schematics, graphs, and charts.

SUBMISSION FORMAT

The electronic file(s) shall be submitted via diskette or CD-ROM. Diskettes or CD-ROMs must be labeled as follows:

DOE Award Number
Type/Frequency of Report(s)
Reporting Period (if applicable)
Name of submitting organization
Name, phone number and fax number of preparer

Diskettes -- Diskettes must be 3.5" double-sided, high-density (1.4 M Byte capacity). If file compression software is used to transmit a PDF file spanning more than one diskette, PKZIP from PKWare, Inc., is the required compression software. State the number of diskettes in the set (e.g., 1/3)

CD-ROM -- The electronic file(s) may be submitted on an ISO9660-format CD-ROM.

FILE NAMING

In naming the electronic file, the Recipient shall use the standard eight-character naming convention for the main file name, and the three character extension applicable to the software use, e.g., .pdf for Adobe.

For the main file name, the first five characters are the last five digits from the award number; e.g., for Award Number DE-FG26-97FT12345, the first five characters are 12345.

The next character represents the technical report and will always be designated as "R".

The remaining two characters indicate the chronological number of the particular type of report; e.g., Quarterly Technical Progress Reports for a 5-year award are numbered R01 through R20. Thus, the main file name for the sixth Quarterly Technical Progress Report under Award No. DE-FG26-99FT12345 would be 12345R06.PDF. If monthly, quarterly, annual, and a final technical report are required, the numbers would run from R01 through R86 (60 monthly reports, 20 quarterly reports, 5 annual reports, and 1 final report).

4.13 ENVIRONMENTAL (MAY 1999)

In response to the requirements of the National Environmental Policy Act of 1969 (NEPA) and other related environmental statutes, the Federal Energy Technology Center (FETC) requires the submission of various documents that assess the environmental aspects and projected impacts of all of its proposed actions. These documents may include the following: (1) Hazardous Substance Plan, (2) Hazardous Waste Report, (3) Environmental Compliance Plan, (4) Environmental Monitoring Plan, and (5) Environmental Status Reports.

The environmental information provided in these documents will enable FETC to fulfill its responsibilities under NEPA (additional information about the requirements of the National Environmental Policy Act can be found in the DOE NEPA Compliance Guide and 40 CFR 1021) and to monitor the Recipient's compliance with other environmental regulations. The implementation of any task associated with a proposed action will be dependent upon DOE submitting and acquiring approval of necessary NEPA documentation. Therefore, to minimize the risk of project delays, it is imperative that these reports are submitted in a timely manner.

The information contained herein specifies the basic environmental requirements for this award, but it is not to be interpreted as containing all necessary information for any given project. Likewise, certain aspects of the requirements may not be applicable. Accordingly, the level of information provided should be sufficient for DOE to assess the environmental implications of the proposed action.

4.14 HAZARDOUS SUBSTANCE PLAN (MAY 1999)

The Recipient shall submit a Hazardous Substance Plan not later than thirty (30) days after an initial award. The Plan shall specifically identify each Hazardous Substance (as defined under 40 CFR 261, Subpart D, entitled Lists of Hazardous Wastes) anticipated to be purchased, utilized or generated in the performance of this award. For each such Hazardous Substance identified, the Plan shall specifically provide the following information:

- Description of Substance/Chemical
- EPA Hazardous Waste Number
- EPA Hazard Code
- Anticipated Quantity to be purchased, utilized or generated
- Anticipated Hazardous Waste Transporter
- Anticipated Hazardous Waste Disposal Facility Contractor and Location (City/Municipality, State)
- Anticipated Treatment Method

4.15 HAZARDOUS WASTE REPORT (MAY 1999)

The Recipient shall submit a Hazardous Waste Report at the completion of award performance. The Report shall specifically identify each Hazardous Waste (as defined under 40 CFR 261, Subpart D, entitled Lists of Hazardous Wastes) actually utilized, or generated in the performance of this award. For each such Hazardous Waste identified, the Report shall specifically provide the following information:

- Description of Substance/Chemical
- EPA Hazardous Waste Number
- EPA Hazard Code
- Actual Quantity Disposed
- Actual Hazardous Waste Transporter
- Actual Hazardous Waste Disposal Facility Contractor and Location (City/Municipality, State)
- Actual Disposal Date
- Actual Treatment Method

The Hazardous Waste Report is intended as a final reconciliation of anticipated versus actual Hazardous Substances purchased, utilized, or generated in the performance of this award.

4.16 PROPERTY REPORTS (MAY 1999)

The FETC Property Handbook entitled "Management of Government Property in the Possession of Contractors," contains forms, instructions, and suggested formats for submission of property reports. This handbook can be found at <http://www.fetc.doe.gov/business/property/980576e.pdf>.

4.17 ANNUAL REPORT OF PROPERTY IN THE CUSTODY OF CONTRACTORS (FETC F 580.1-8) (MAY 1999)

This report includes **ALL** government-owned, purchased and furnished property and materials for which the Recipient is accountable to the Government. This report shall also include Government Property at subcontractor's plants and alternate locations. This report is submitted on FETC F 580.1-8 for the period ending September 30 and is due by October 15.

4.18 REPORT OF TERMINATION OR COMPLETION INVENTORY (SF-1428 AND SF-120) (MAY 1999)

This report submitted on the SF-1428 and SF-120 is due immediately upon completion or termination of the award. The Recipient is required to perform and cause each subcontractor to perform a physical inventory, adequate for disposal purposes, of all Government property applicable to the award.

4.19 HOT LINE REPORT (MAY 1999)

The "Hot Line Report" may be used to report a major breakthrough in research, development, or design; an event causing a significant schedule slippage or cost growth; an environmental, safety and health violation; achievement of or failure to achieve an important technical objective; or any requirement for quickly documented direction or redirection. The report shall be submitted by the most rapid means available, usually electronic, and should confirm telephone conversations with DOE representatives. Identification as a "Hot Line Report" serves notice at each link in the delivery chain that expedition in handling is required. Unless otherwise agreed by the parties involved, DOE is expected to take action and respond in a similarly timely manner. The report should include:

1. Recipient's name and address;
2. Award title and number;
3. Date;
4. Brief statement of problem or event;
5. Anticipated impacts; and
6. Corrective action taken or recommended.

Hot line reports shall document the incidents listed below:

1. Any single fatality or injuries requiring hospitalization of five or more individuals is to be immediately reported.
2. Any significant environmental permit violation is to be reported as soon as possible, but within 24 hours of the discovery of the incident.
3. Other incidents that have the potential for high visibility in the media are to be reported as quickly as possible, but within 24 hours following discovery.
4. Any failure resulting in damage to Government-owned equipment in excess of \$50,000 is to be reported as quickly as possible, but within 24 hours of the discovery of the failure.
5. Any unplanned event which is anticipated to cause a schedule slippage or cost increase significant to the project is to be reported within 24 hours.
6. Any verbal or written Notice of Violation of any Environmental, Safety, and Health statutes arising from the performance of this award is to be immediately reported.

7. Any accidental spill or release which is in violation of any Environmental, Safety, and Health statutes arising from the performance of this award is to be immediately reported, but within 24 hours of the discovery of the accident.

8. Any incident which causes a significant process or hazard control system failure, or is indicative of one which may lead to any of the above defined incidents, is to be reported as soon as possible, but within 5 days of discovery.

The requirement to submit Hot Line Reports for the incidents identified in 1, 2, 3, 6, or 7 is for the sole purpose of enabling DOE officials to respond to questions relating to such events from the media and other public.

When an incident is reported in accordance with 4, 5, 6, 7, or 8, the Recipient shall conduct an investigation of its cause and make an assessment of the adequacy of resultant action. A written report is required no later than ten (10) calendar days following the incident and shall include an analysis of the pertinent facts regarding the cause, and a schedule of the remedial events and time periods necessary to correct the action.

When an event results in the need to issue a written or verbal statement to the local media, the statement is to be cleared first; if possible, and coordinated with FETC Management and Communications Division, the Contracting Officer Representative (COR) and the Contracting Officer.

4.20 JOURNAL ARTICLES, CONFERENCE PAPERS AND PROCEEDINGS GENERATED BY LARGE BUSINESSES FOR DOE REVIEW (FEB 1999)

The Recipient shall submit to DOE for review and approval all documents generated by the Recipient, or any subcontractor, which communicate the results of scientific or technical work supported by DOE under this award, whether or not specifically identified in the award, prior to submission for publication, announcement, or presentation. Such documents include journal articles, conference papers and proceedings, etc. Each such document shall be accompanied by a properly completed FETC Form 2050.4, "Request for Patent Clearance for Release of Contracted Research Documents."

The Recipient shall simultaneously submit a draft version of the document to the DOE COR and the DOE Patent Counsel Office prior to the publication, presentation, or announcement. The document submitted to the DOE Patent Counsel shall be accompanied by a completed FETC Form 2050.4. The DOE COR and DOE Patent Counsel shall review the draft version of the document and notify the Recipient of approval or recommended changes. The approved final version shall be submitted to the FETC AAD Document Control Coordinator.

The following information shall be provided for conference papers and proceedings, etc.

- Name of conference
- Location of conference (city, state, and country)
- Date of conference (month/day/year)
- Conference sponsor

4.21 JOURNAL ARTICLES, CONFERENCE PAPERS AND PROCEEDINGS GENERATED BY A SMALL BUSINESS OR NONPROFIT ORGANIZATION FOR DOE REVIEW (FEB 1999)

The Recipient shall submit to DOE for review and approval all documents generated by the Recipient, or any subcontractor, which communicate the results of scientific or technical work supported by DOE under this award, whether or not specifically identified in the award, prior to submission for publication, announcement, or presentation. Such documents include journal articles, conference papers and proceedings, etc. Each such document shall be accompanied by a properly completed FETC Form 2050.4, "Request for Patent Clearance for Release of Contracted Research Documents."

The Recipient shall submit a draft version of the document to the COR prior to the publication, presentation, or announcement. The COR shall review the draft version of the document and notify the Recipient of approval

or recommended changes. The final version, along with a completed FETC Form 2050.4, shall be submitted to the FETC AAD Document Control Coordinator.

The following information shall be provided for conference papers and proceedings, etc.

- Name of conference
- Location of conference (city, state, and country)
- Date of conference (month/day/year)
- Conference sponsor

4.22 JOURNAL ARTICLES, CONFERENCE PAPERS AND PROCEEDINGS GENERATED BY A UNIVERSITY FOR DOE REVIEW (FEB 1999)

The Recipient shall submit to DOE for review and comment all documents generated by the Recipient, or any subcontractor, which communicate the results of scientific or technical work supported by DOE under this award, whether or not specifically identified in the award, prior to submission for publication, announcement, or presentation. Such documents include journal articles, conference papers and proceedings, etc. Each such document shall be accompanied by a properly completed FETC Form 2050.4, "Request for Patent Clearance for Release of Contracted Research Documents."

The Recipient shall submit a draft version of the document to the COR prior to the publication, presentation, or announcement. The COR shall review the draft version of the document and notify the Recipient of recommended changes. The final version, along with a completed FETC Form 2050.4, shall be submitted to the FETC AAD Document Control Coordinator.

The following information shall be provided for conference papers and proceedings, etc.

- Name of conference
- Location of conference (city, state, and country)
- Date of conference (month/day/year)
- Conference sponsor

4.23 ATTACHMENT C -- BUDGET PAGES (APR 1999)

The budget documents (DOE Form 4620.1 or er F4620.1A or the SF424 or the DOE 4600.4) will be inserted on this page upon award.

The Applicant must prepare the budget documents and include them in Volume I - Business and Financial Application. These document and instructions for completion of the documents can be found on the FETC homepage at: ***<http://www.fetc.doe.gov/business/forms.forms.html>***

4.24 ATTACHMENT D -- RECIPIENT ACQUIRED PROPERTY (JAN 1999)

Recipient acquired property will be listed on this page upon award.

4.25 ATTACHMENT E-- FEDERALLY OWNED PROPERTY -- GOVERNMENT FURNISHED (JAN 1999)

The Government does not anticipate providing any Government Furnished Property, however, if Government Furnished Property is proposed, the property will be listed on this page upon award.

SECTION V -- CONDITIONS AND NOTICES

5.1 NUMBER AND TYPE OF AWARDS (AUG 1999)

It is anticipated that there will be multiple awards resulting from this solicitation. However, the Government reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this solicitation and will award that number of financial assistance instruments which serve the public purpose and are in the best interest of the Government. The Government intends to use a cooperative agreement type of award instrument.

5.2 COST SHARING (AUG 1999)

Cost sharing is not required, but is encouraged in this action. The cost share may include otherwise allowable costs as in-kind contributions. Unallowable costs include:

Costs incurred in negotiating an award with DOE are not allowable as direct charges to the project.

DOE shall not accept valuation for property sold, transferred, exchanged, or manipulated in any way to acquire a new basis for depreciation purposes or to establish a fair use value in circumstances that would amount to a transaction for the purpose of the award.

DOE will not share in both the direct cost and depreciation on the same item. Depreciation is not allowable for cost sharing on any item previously charged to the project as a direct cost. For example, DOE will cost share the direct cost on equipment or facilities purchased or constructed for the project; but, will not also cost share the depreciation.

Interest on borrows (however represented) and other financial costs such as bond discounts, cost of financing and refinancing capital (net worth plus long-term liabilities), are unallowable project costs. This includes interest on funds borrowed for construction.

Facilities capital cost of money shall be an unallowable cost on all real property or equipment acquired by or on behalf of the Recipient in connection with the performance of the project.

Previously expended research, development, or exploration costs are unallowable.

Forgone fees, forgone profits, or forgone revenues are unallowable.

Fee or profit paid to any member of the proposing team having a substantial interest in the project is unallowable. Competitive subcontracts placed with the prior written consent of the Contracting Officer and subcontracts for routine supplies and services are not covered by this prohibition.

The value of patents and data contributed to the project is unallowable.

Allowable costs under past, present, or future Federal Government contracts, grants or Cooperative Agreements may not be charged against this award. Likewise, the Recipient may not charge costs allowable under this project, including any portion of its cost share to the Federal Government under any other contracts, grants, or Cooperative Agreements.

Business losses are unallowable.

5.3 CONTENT OF RESULTING AWARD (JULY 1999)

Any agreement awarded as a result of this solicitation will contain Sections I-IV of this solicitation and shall be subject to the terms and conditions addressed therein, as applicable.

5.4 APPLICATION PREPARATION COSTS (AUG 1999)

DOE is under no obligation to pay for any costs associated with the preparation or submission of applications.

5.5 COMMITMENT OF PUBLIC FUNDS (AUG 1999)

The Contracting Officer is the only individual who can legally commit the Government to the expenditure of public funds in connection with the proposed award. Any other commitment, either explicit or implied, is invalid.

5.6 AVAILABILITY OF FUNDS (AUG 1999)

It is estimated that \$15-18 million will be available for awards under this solicitation, subject to the availability of funds.

5.7 PRE-APPLICATION CONFERENCE IS NOT PLANNED (JULY 1999)

A pre-application conference is not contemplated.

5.8 FALSE STATEMENTS (AUG 1999)

Applications must set forth full, accurate, and complete information as required by this solicitation. The penalty for making false statements in applications is prescribed in 18 U.S.C. 1001.

5.9 AMENDMENTS TO SOLICITATION (AUG 1999)

The only method by which any term of this solicitation may be amended is by an express, formal amendment generated by the issuing office. No other communication, whether written or oral will amend or supersede the terms of this solicitation.

Amendments to the solicitation will be posted on FETC's website at <http://www.fetc.doe.gov/business/solicit/>.

5.10 CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER (CFDA) (AUG 1999)

81.089

5.11 APPLICANT ELIGIBILITY (AUG 1999)

All responsible individuals, corporations, non-profit organizations, educational institutions, and state or local governments may submit applications for consideration.

5.12 PARTICIPATION BY FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS (FFRDC) AND DEPARTMENT OF ENERGY (DOE) MANAGEMENT AND OPERATIONS (M&O) CONTRACTORS (APR 1999)

Proposed Use of a DOE M&O Contractor

Applications submitted by, or substantially relying upon the technical expertise of, FFRDCs and DOE M&O contractors are not desired, will not be evaluated, and will not be eligible for an award under this solicitation. Applicants are encouraged to maximize the use of private sector organizations in the performance of the proposed effort. However, an application that includes performance by an FFRDC or DOE M&O contractor(s) as a subcontractor will be evaluated and may be considered for an award, provided that: (1) the proposed use of any such entities is specifically authorized by the cognizant agency for the FFRDC or DOE for DOE M&O contractors, in accordance with the procedures established for the FFRDC or the M&O contractor; (2) the work is not otherwise available from the private sector; and (3) the estimated cost of the FFRDC or M&O contractor work does not exceed 25 percent of the total estimated project cost. DOE reserves the right to fund the work through a DOE field work proposal or an interagency agreement.

Application Submission Requirements

In addition to the application information to be provided by the applicant as set forth in other parts of this Section V, the following requirements apply:

1. Justification.

The offeror shall submit a letter with its application (Volume I) which states that to the best of its knowledge, the work requested will not place the FFRDC or the DOE M&O contractor in direct competition with the domestic private sector, and that the proposed scope of work cannot be performed by any private entity.

2. Work Scope.

The offeror shall submit a detailed scope of work which clearly identifies that portion of the proposed effort for which the expertise and ability to perform lies solely with the DOE M&O contractor. This detailed scope of work shall be provided as an appendix to the Volume II, Technical Application.

3. Cost Information.

The offeror shall provide cost information for that portion of the proposed work scope (see 2, above) to be performed by the DOE M&O contractor. The cost information shall be furnished in the same format and level of detail as prescribed for subcontractors. The estimated cost of the effort shall be clearly identified in the Volume I, Business and Financial Application.

5.13 TIME, DATE AND PLACE APPLICATIONS ARE DUE - MULTIPLE DUE DATES (AUG 1999)

Applications shall be submitted in paper and disk media in sealed envelopes or packages addressed to the office and point of contact specified below:

APPLICATIONS MUST BE RECEIVED AT THE FOLLOWING MAILING ADDRESS NO LATER THEN 4:00 P.M. EST FOR EACH EVALUATION PERIOD STATED BELOW.

<u>Evaluation Period</u>	<u>Closing Date</u>
1	January 3, 2000
2	May 1, 2000

Applications that are received after the first due date will be retained and evaluated during the subsequent evaluation period.

U. S. Department of Energy
Federal Energy Technology Center
P. O. Box 880
3610 Collins Ferry Road
Morgantown, WV 26507-0880

Point of Contact: Deborah J. Boggs
Telephone Number: (304)285-4473
Fax Number: (304)285-4683
E-MAIL Address: dboggs@fetc.doe.gov
Contracting Officer: Randolph R. Cooper

External Marking of Applications

Applications shall be marked with the following information:

- (1) The address of Proposer
- (2) Solicitation Number
- (3) Due Time and Date of Applications
- (4) Point of Contact at Issuing Office

5.14 FEE AND PROFIT (JULY 1999)

Fee or profit will not be paid to the recipients of financial assistance awards resulting from this solicitation.

5.15 DETERMINATION OF RESPONSIBILITY (AUG 1999)

DOE will evaluate the potential Recipient's responsibility before an award. Responsibility determinations are focused on the recipient's capability to manage and account for the funds, property and other assets provided to perform satisfactorily under the terms of the award. If a potential recipient is determined to not be in compliance or cannot or will not comply with generally applicable requirements (see 10 CFR Part 600, Appendix A), the Contracting Officer will find the recipient not responsible and may either disapprove the application or use special restrictive conditions as a term of award.

5.16 TREATMENT OF PROPRIETARY INFORMATION (AUG 1999)

An application may include technical data and other data, including trade secrets and/or privileged or confidential commercial or financial information, which the applicant does not want disclosed to the public or used by the Government for any purpose other than application evaluation. To protect such data, the applicant should specifically identify each page including each line or paragraph thereof containing the data to be protected and mark the cover sheet of the application with the following Notice as well as referring to the Notice on each page to which the Notice applies:

NOTICE OF RESTRICTION ON DISCLOSURE AND USE OF DATA

The data contained in pages [TBD] of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data therein to the extent provided in the award. This restriction does not limit the Government's right to use or disclose data obtained without restriction from any source, including the applicant.

DOE shall not refuse to consider an application solely on the basis that the application is restrictively marked.

5.17 TELEGRAPHIC AND E-MAIL APPLICATIONS (JULY 1999)

Telegraphic applications will **NOT** be considered although applications may be amended by telegraphic notice provided such notice is received prior to the date and time specified for receipt. The term "Telegraphic" includes both mailgrams and facsimile submissions. Applications submitted by E-mail or other electronic means will **NOT** be considered.

5.18 LATE APPLICATIONS, AMENDMENTS AND WITHDRAWALS OF APPLICATIONS (AUG 1999)

An application or amendment of an application shall be timely if it is:

- (a) Received at the location on or before any of the deadline dates and times specified in this section;
- or

(b) Received after the deadline, and was sent by first-class mail, was postmarked on or before the deadline date, and is received by DOE before technical evaluation of all acceptable applications submitted in response to the solicitation begins. Applicants should obtain a legibly dated mailing receipt from the U.S. Postal Service or use certified or registered mail to enable them to substantiate the date of mailing. Private metered postmarks shall not be acceptable proof of the date of mailing.

DOE shall return an application that does not meet the requirements of (a) or (b) above. DOE may return an application that does not include all information and documentation required by the solicitation, if in the judgement of the DOE Contracting Officer, the nature of the omission precludes review of the application.

Applications or amendments of applications may be withdrawn by written notice at any time before an award. Written notice includes e-mails and facsimiles. An authorized representative may withdraw applications in person, if the representative's identity is made known and the representative signs a receipt for the application before an award.

5.19 EVALUATION PERSONNEL (AUG 1999)

Applications will be evaluated in accordance with the criteria set forth in Section VII of the solicitation. In conducting this evaluation, the Government may utilize, in accordance with the requirements of 10 CFR Part 600, assistance and advice from qualified personnel from other Federal Agencies, DOE Contractors, universities and industry. Applicants shall indicate in Volume I if they do not wish to have their applications evaluated by nonfederal personnel. Applicants are further advised that DOE may be unable to consider an application withholding such consent.

5.20 DOE TREATMENT OF APPLICATION INFORMATION (JULY 1999)

When using personnel from other Federal agencies, DOE contractors, or other consultants to DOE in the evaluation of applications, DOE will obtain assurances from all evaluators that DOE's commitments are met relating to the proprietary nature of any application information.

5.21 APPLICATION CLARIFICATION (JULY 1999)

DOE reserves the right to require applications to be clarified or supplemented to the extent considered necessary either through additional written submissions or oral presentations.

5.22 AWARD WITHOUT DISCUSSIONS (AUG 1999)

Notice is given that an award may be made after few or no exchanges, discussions or negotiations. Therefore, all applicants are advised to submit their most favorable application to the Government.

5.23 GOVERNMENT RIGHT TO REJECT OR NEGOTIATE (JULY 1999)

The Government reserves the right, without qualification, to reject any or all applications received in response to this solicitation and to select any application, in whole or in part, as a basis for negotiation and/or award.

5.24 ANTICIPATED SELECTION AND AWARD DATES - MULTIPLE DUE DATES (AUG 1999)

The following reflects the anticipated selection dates by evaluation period. Awards are expected to be made within 90 calendar days following the selection.

<u>Evaluation Period</u>	<u>Anticipated Selection Date</u>
1	March 31, 2000
2	August 31, 2000

5.25 NOTIFICATION TO UNSUCCESSFUL APPLICANTS (AUG 1999)

Written notice will be provided to unsuccessful applicants after selection in accordance with 10 CFR 600.19. Information about selected projects will be made publicly available.

5.26 APPLICATION ACCEPTANCE PERIOD (AUG 1999)

The minimum application acceptance period shall be 180 calendar days after the deadline(s) for receipt of applications.

5.27 DISPOSITION OF APPLICATIONS (AUG 1999)

Applications will not be returned unless they are timely withdrawn.

5.28 PRESUBMISSION REVIEW AND CLEARANCES (AUG 1999)

Presubmission review under Executive Order 12372, "Intergovernmental Review of Federal Programs" is not required.

5.29 PROJECT PERIOD (AUG 1999)

The Government anticipates the project period for the subject awards to be 3 years. Awards will have project and budget periods that are specific to the project and funding. Awards longer than one year will include continuation periods which will be subject to the availability of funds.

5.30 SIMPSON-CRAIG AMENDMENT (JULY 1999)

Organizations which are described in section 501(c)(4) of the Internal Revenue Code of 1986 and engage in lobbying activities after December 31, 1995, shall not be eligible for the receipt of Federal funds constituting an award, grant, or loan. Section 501(c)(4) of the Internal Revenue Code of 1986 covers:

"Civic leagues or organizations not organized for profit but operated exclusively for the promotion of social welfare, or local associations of employees, the membership of which is limited to the employees of a designated person or persons in a particular municipality, and the net earnings of which are devoted exclusively to charitable, educational or recreational purposes."

Lobbying activities are defined broadly to include, among other things, contacts on behalf of an organization with specified employees of the Executive Branch and Congress with regard to Federal legislative, regulatory and program administrative matters.

5.31 LOANS NOT AVAILABLE (JULY 1999)

Loans are not available under the DOE Minority Economic Impact (MEI) loan program, 10 CFR Part 800, to finance the cost of preparing a financial assistance application.

5.32 DEBRIEFINGS - MULTIPLE DUE DATES (AUG 1999)

Applicants may submit an application more than once (i.e., after application is rejected) within the solicitation period. Each unsuccessful applicant will be offered the opportunity for an explanation or debriefing as to why the application was not selected. Debriefings will be conducted at the earliest feasible time.

5.33 NATIONAL ENVIRONMENTAL POLICY ACT STRATEGY (JULY 1999)

The National Environmental Policy Act of 1969 (NEPA) establishes a national policy to ensure that consideration is given to environmental values and factors in Federal planning and decision making. The Department of Energy's policy is to comply fully with the letter and spirit of NEPA. To ensure that environmental factors are considered in the decision making process and to promote environmentally responsible decisions, DOE incorporates NEPA requirements early in the planning process for proposed actions. Consistent with Council on Environmental Quality (CEQ) NEPA regulations (40 CFR Parts 1500-1508) and DOE NEPA regulations (10 CFR Part 1021), an overall strategy for compliance with NEPA has been developed. This includes performing project-specific environmental reviews of environmental issues pertinent to each proposed project before projects are selected, followed by site-specific environmental reviews of each project after DOE selection. It is probably that most, if not all, of the projects proposed under this solicitation will not have a significant effect on the environment, and as such, in accordance with DOE NEPA regulations, will be candidates for "categorical exclusions" (CX) and thus will not require the preparation of an environmental assessment or environmental impact statement. A CX is prepared for actions that obviously do not have a significant environmental impact. To qualify for a CX, a project must be an excluded action and meet certain site-specific criteria. These criteria concern adverse effects on flood plains, wetlands, archeological sites, Indian lands, etc. For further information on categorical exclusions, see 10 CFR Part 1021.410.

No action taken by DOE with regard to any application prior to the completion of the site-specific analysis, including project selection or award, shall be a final decision for purposes of compliance with NEPA.

5.34 PRE-SELECTION PROJECT-SPECIFIC ENVIRONMENTAL QUESTIONNAIRE (JULY 1999)

For Applications that undergo comprehensive evaluation, DOE will review project-specific environmental information supplied by the applicant on the Environmental Questionnaire which is submitted as part of Volume I, Business and Financial application.

5.35 POST-SELECTION ENVIRONMENTAL REVIEW (JULY 1999)

Soon after selection, depending on the information necessary to satisfy NEPA, applicants may be requested to provide additional environmental information which is more detailed than that provided on the Environmental Questionnaire of this solicitation. This detailed site-and project-specific information may be used as the basis for site-specific NEPA documents prepared by DOE for each selected project. Such NEPA documents shall be prepared, considered, and published by DOE in full conformance with the requirements of the CEQ. regulation and 10 CFR Part 1021.

5.36 POST-AWARD ENVIRONMENTAL MONITORING (JULY 1999)

Each resulting award will specify the monitoring and reporting requirements necessary to ensure compliance with applicable environmental regulations, and permits obtained from Federal, state and local government agencies and DOE guidelines on NEPA.

5.37 52.227-6 ROYALTY INFORMATION. (APR 1984)

(a) Cost or charges for royalties. When the response to this solicitation contains costs or charges for royalties totaling more than \$250, the following information shall be included in the response relating to each separate item of a royalty or license fee:

(1) Name and address of licensor.

(2) Date of license agreement.

(3) Patent numbers, patent application serial numbers, or other basis on which the royalty is payable.

(4) Brief description, including any part or model numbers of each contract item or component on which the royalty is payable.

(5) Percentage or dollar rate of royalty per unit.

(6) Unit price of contract item.

(7) Number of units.

(8) Total dollar amount of royalties.

(b) Copies of current licenses. In addition, if specifically requested by the Contracting Officer before execution of the contract, the offeror shall furnish a copy of the current license agreement and an identification of applicable claims of specific patents.

5.38 952.227-84 NOTICE OF RIGHT TO REQUEST PATENT WAIVER. (FEB 1998)

Offerors have the right to request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of the contract that may be awarded as a result of this solicitation, in advance of or within 30 days after the effective date of contracting. Even where such advance waiver is not requested or the request is denied, the contractor will have a continuing right under the contract to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the contract. Domestic small businesses and domestic nonprofit organizations normally will receive the patent rights clause at DEAR 952.227-11 which permits the contractor to retain title to such inventions, except under contracts for management or operation of a Government-owned research and development facility or under contracts involving exceptional circumstances or intelligence activities. Therefore, small businesses and nonprofit organizations normally need not request a waiver. See the patent rights clause in the draft contract in this solicitation. See DOE's patent waiver regulations at 10 CFR part 784.

5.39 NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES (NOV 1998)

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

5.40 UNNECESSARILY ELABORATE APPLICATIONS (JULY 1999)

Unnecessarily elaborate brochures or other presentations beyond those sufficient to present a complete and effective response to this solicitation is not desired and may be construed as an indication of the applicant's lack of cost consciousness. Elaborate art work, expensive paper and bindings, and expensive visual and other presentation aids are neither necessary nor wanted.

SECTION VI -- APPLICATION PREPARATION INSTRUCTIONS

6.1 APPLICATION PREPARATION INSTRUCTIONS -- GENERAL (JULY 1999)

The application shall be prepared as set forth herein to provide a standard basis for evaluation and to insure that each application will be uniform as to format and sequence. These instructions are not to be included in your application.

Applications shall be prepared in accordance with this section. To aid in evaluation, applications shall be clearly and concisely written as well as being neat, indexed (cross-indexed as appropriate) and logically assembled. All pages of each part shall be appropriately numbered and identified with the name of the applicant, the date and the solicitation number to the extent practicable. Each volume is a stand alone document, therefore, some information provided may need to be included in both volumes.

Each application should clearly demonstrate the applicant's capability, knowledge, and experience in regard to the requirements described herein. Failure to respond or follow the instructions regarding the organization and content of the application may result in the application being deemed unacceptable.

DOE may return an application that does not include all information and documentation required by statute, 10 CFR Part 600, or the solicitation when the nature of the omission precludes review of the application. During the review of a complete application, DOE may request the submission of additional information if the information is essential to evaluate the application.

6.2 OVERALL ARRANGEMENT OF APPLICATION (AUG 1999)

The overall application shall consist of two (2) physically separated volumes, individually entitled as stated below. Submit the required number of each application volumes shown in the matrix below.

<u>VOLUME</u>	<u>ORIGINAL</u>	<u>NUMBER OF COPIES</u>	<u>ELECTRONIC VERSION</u>
Volume I -- Business and Financial Application	1	3	1
Volume II -- Technical Application	1	3	1*

*The electronic version of the technical application shall be submitted in WordPerfect 6.1 or Adobe Acrobat Portable Document format.

6.3 VOLUME I -- BUSINESS AND FINANCIAL APPLICATION PREPARATION INSTRUCTIONS (AUG 1999)

Volume I consist of an application coversheet, application forms, assurances, budget pages, environmental questionnaire, exceptions and deviations to the model award, and any other business and financial information.

The application identified as the original shall contain all original signatures of all documents requiring a signature by the offeror. Use of reproductions of signed originals is authorized in all other copies of the application.

The applicant shall not provide application information in three-ring binders.

Format and Content.

ALL FORMS NEEDED FOR PREPARATION OF VOLUME I ARE FOUND ON THE FETC HOMEPAGE AT: <http://www.fetc.doe.gov/business/forms/forms.html> IN EITHER WORDPERFECT or PDF format. PLEASE NOTE THAT ALL FORMS WERE DEVELOPED USING WORDPERFECT 6.1 AND FORMATTED FOR PRINTING USING AN HP LASERJET III Si PRINTER. QUESTIONS ON COMPLETION OF THE FORMS SHOULD BE ADDRESSED TO THE CONTRACT SPECIALIST.

Volume I shall include the following documents (in the order listed):

1. VOLUME I BUSINESS AND FINANCIAL APPLICATION COVERSHEET

The Application Coversheet for Volume I shall contain the following information:

Solicitation Number
Due Time and Date of Applications
Name and Address of Proposer
Point of Contact
Telephone/FAX Number
Title of Project
Topic Area of Interest

2. APPLICATION FOR FEDERAL ASSISTANCE Standard Form 424

3. FINANCIAL ASSISTANCE ASSURANCE PACKAGE -- **Filename: assurefa**

4. BUDGET PAGE(S)

The applicant must provide a detailed budget information on one or more of the following budget forms. Supporting cost data shall be submitted as indicated by the instructions.

Failure to provide the detailed cost information as described in the instructions will result in an incomplete package. If a minimum cost share is required by this solicitation, the applicant shall stipulate in the application the source and amount of cost sharing and the value of third party in-kind contributions proposed to meet the requirement.

- a. Federal Assistance Budget Information -- DOE F 4600.4
- b. Budget Page-- DOE F 4620.1
- c. Grant Application Project Period Summary -- ER F 4620.1A
- d. Budget Information -Non-Construction Programs -- SF424a

5. ENVIRONMENTAL QUESTIONNAIRE -- **Filename: nepasol**

6. EXCEPTIONS AND DEVIATIONS TAKEN TO THE MODEL AGREEMENT

The offeror shall identify and explain any exceptions or deviations taken or conditional assumptions made with respect to the model agreement, the requirements of this Section, and other matters included in Volume I.

Any exceptions taken must contain sufficient amplification and justification to permit evaluation. The benefit to the Government shall be explained for each exception taken. Such exceptions will not, of themselves, automatically cause an application to be termed unacceptable. A large number of exceptions, or one or more significant exceptions not providing benefit to the Government, however, may result in rejection of your application(s) as unacceptable.

7. SUMMARY OF EXCEPTIONS AND DEVIATIONS TAKEN IN OTHER VOLUMES

The offeror shall summarize each technical, cost, business, or other exceptions taken elsewhere, and provide specific cross references to its full discussion.

6.4 VOLUME II-- TECHNICAL APPLICATION PREPARATION INSTRUCTIONS (AUG 1999)

The proposer shall include a technical discussion in the format specified below. This format relates to the technical evaluation criteria found in Section VII. Alternate heading names and additional headings may be included as desired.

In order to produce a comprehensive application for this solicitation, the applicant should address, at a minimum, the areas listed below. To help facilitate the review process and to insure addressing all the review criteria, the applicant shall use the following Table of Contents when preparing the technical application.

TABLE OF CONTENTS

Public Abstract	i
Table of Contents	ii
List of Tables	iii
List of Figures	iv
List of Acronyms	v
General Technical Information	
1. Scientific and Technical Merit	1
2. Technical Approach and Understanding	#
3. Sequestration Potential	#
4. Likelihood of Commercial Application	#
5. Qualification of Organization and Key Personnel and Adequacy of Facilities/Resources	#
Technical Exceptions and Deviations	#
	≤ 30 pages
Appendices	
A. Statement of Project Objectives	A1
B. Resumes	A2
C. Additional Pertinent Publications (if any)	A3

6.5 PUBLIC ABSTRACT (JULY 1999)

This section shall contain a public abstract of not more than one (1) typewritten page clearly stating the objectives of research, the title of the project, methodology, and sponsoring organization (s). It is a stand-alone document. This abstract may be released to the public by DOE in whole or in part any time. It is, therefore, required that it shall not contain proprietary data or confidential business information.

6.6 GENERAL TECHNICAL INFORMATION (AUG 1999)

The technical application will consist of the applicant's outline addressing the technical and management aspects of the assistance action, the applicant's capabilities and what the applicant will do to satisfy the requirements of the Statement of Project Objectives. Since the technical information contained in this section will be evaluated to determine such matters as understanding of the work to be performed, technical approach, and potential for completing the desired work, it should be specific and complete in every detail. The application should be practical and be prepared simply and economically, providing a straightforward, concise delineation of what it is the applicant will do to satisfy the requirements of the Statement of Project Objectives.

In order that the Technical Application may be evaluated strictly on the merit of the material submitted, no cost information is to be included in the Technical Application. Where estimated man-hours will provide clarity, they shall be quoted in man-hour figures only, with no indication as to the cost of these man-hours.

The application shall not merely offer to perform work in accordance with the Statement of Project Objectives but shall describe the actual work proposed.

The Technical Application shall not exceed 30 pages excluding resumes and shall be submitted in separate volumes and computer disks from and separated from the cost data. The application shall contain only single-sided pages. The statement of project objectives, resumes and additional pertinent publications are to be attachments to the Technical Application and will not be included in the page limitation. Pages in excess of the

page limitation will be removed from the application and discarded prior to evaluation. The proposed text shall be typed, single spaced, using Elite size (12 pitch) type (or computer font equivalent) and printed, unreduced on size 8 1/2-inch by 11-inch paper. Illustrations shall be legible and no longer than 11-inch by 17-inch foldouts, as appropriate for the subject matter. Each 11-inch by 17-inch fold-out is considered two pages when determining the number of pages. Pages of each volume shall be sequentially numbered with the volume and page numbers on each page. Except as otherwise noted in the solicitation, the page guidelines previously set forth constitute a limitation on the total amount of material that may be submitted for evaluation. No material may be incorporated in any application by reference as a means to circumvent the page limitation. In addition, the same shall be submitted on a computer disk or compact disk or compact disk in WordPerfect 6.1 format for Windows.

All measurements described in the application shall be expressed in the metric (SI) system with the customary unit conversion in parentheses. Additionally, applicants are hereby notified that any instrumentation associated with tasks which will be performed will be required to be in the SI system and all technical reporting will require information in the SI system. The applicant shall provide a Gant chart or equivalent depicting the project schedule, milestones and interrelationship of the project tasks. The applicant shall identify the critical path which identifies the sequential tasks which, if not completed on time, will result in a delay in the overall project schedule. All significant milestones shall be defined in a milestone log and depicted on the schedule.

The applicant shall provide the technical information as follows:

1. SCIENTIFIC AND TECHNICAL MERIT

Discuss the proposed research plan and methodology to achieve the contract objectives on an overall and task-by-task basis. Discuss significant scientific and/or technically challenging concepts underlying the proposed approach. Discuss how the proposed work moves beyond the current state-of-the-art. Distinguish this approach from past and current practice and investigations. Discuss how the proposed research could contribute to the possibility of a scientific or engineering breakthrough. Show how the application of the proposed concept would reduce emissions below those resulting from improvements or advances in system cycle efficiencies; provides for reuse or production of valuable byproducts; or provides innovative long-term storage or disposal of greenhouse gases. Address expected compatibility of the technology with the environment, including protection of human health and sensitive ecosystems.

2. TECHNICAL APPROACH AND UNDERSTANDING

Discuss the manner in which the offeror proposes to accomplish the work, including identification of anticipated problems and proposed solutions. Show the soundness and adequacy of the proposed work to proving the feasibility of the concept. Include the degree to which the activity is likely to produce other benefits, in addition to sequestration. Clearly discuss the technical basis for the proposed work including discussions on relevant technical issues, existing technical barriers, and pertinent research past and current. The applicant shall discuss their specific goals of the FETC Carbon Sequestration Program. The applicant shall discuss their understanding of relevant and current state-of-the art practices. Address technology effectively related to the solicitation objectives.

3. SEQUESTRATION POTENTIAL

Calculate the maximum expected emission reduction or offset of greenhouse gas, expressed in millions of tons per year of carbon equivalent. Include the potential impact in terms of applicability to a large number of sites or types of sources, and quantity (tons) of greenhouse gases that would be recovered or sequestered. Include the feasibility of the proposed concept for the development of path-breaking, less costly means to addressing greenhouse gas emissions. Describe the ability of the technology to address different types of emission sources. If activities, including research on improving scientific knowledge and understanding or developing modeling and assessment tools are proposed, address the knowledge basis for the development of technologies to impact large quantities of greenhouse gases.

4. LIKELIHOOD OF COMMERCIAL APPLICATION

Provide the expected cost of commercializing the sequestration technology, expressed in dollars per ton of carbon equivalent emission avoided. Describe the capability to compete with other commercial processes. Demonstrate the degree to which the activity identifies and makes progress on new concepts, thereby increasing the likelihood of a successful sequestration program. Identify parties capable of commercializing in a timely manner or producing products using the proposed technology. Estimate the length of time before the project is likely to be commercially successful. Show the likelihood of obtaining patent or property rights. Identify the potential of securing cost sharing including in-kind contributions and corporate commitment. If fundamental scientific knowledge and understanding are proposed, identify how it can contribute to the development of commercial technologies.

5. QUALIFICATION OF ORGANIZATION AND KEY PERSONNEL AND ADEQUACY OF FACILITIES/RESOURCES

Submit a comprehensive resume of directly related experience and the relevant background of the Principal Investigator assigned to the program, other key staff, and consultants, if any. The applicant shall provide appropriate charts illustrating the proposed project organization showing names, position titles, and lines of authority for personnel who will be assigned to the project. Provide detailed qualifications of any proposed U.S. industrial partner in regard to the capability to demonstrate successful technologies at large scale. Indicate whether these personnel are presently available or at what point they will be available. Include an estimate of the time commitment of each of these persons to the program. For other technical support personnel, indicate the extent of their education and/or training and provide a brief summary of work experience which qualifies them to participate in the project. If proposed, provide the rationale for and corporate commitment to any teaming arrangement as well as any key personnel having previously worked together by briefly describing the type and scope of the project(s) involved. Provide the availability and time commitments of proposed personnel.

Identify type, quality, and availability of the proposed equipment, materials, and facilities. Determine the adequacy of the proposed facilities to conduct and support laboratory/bench scale testing, prototype development, and field testing activities. Provide justification for purchase or lease of facilities, equipment, or materials.

6.7 TECHNICAL EXCEPTIONS AND DEVIATIONS (JULY 1999)

This section shall identify and explain any exceptions or deviations taken or conditional assumptions made with respect to the technical requirements of the solicitation.

Any exceptions taken must contain sufficient amplification and justification to permit evaluation. All benefits to the Government shall be explained for each exception taken. Such exceptions will not, of themselves, automatically cause an application to be termed unacceptable. However, a large number of exceptions, or one or more significant exceptions not providing benefit to the Government may result in rejection of the application(s) as unacceptable.

6.8 APPENDICES -- Statement of Project Objectives Instructions (JULY 1999)

All applications must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below.

Applicants shall prepare the Statement of Project Objectives in the following format:

TITLE OF WORK TO BE PERFORMED

(Insert title of work to be performed. Be concise and descriptive.)

A. OBJECTIVES

Include one paragraph on the overall objective(s) of the work. Also, include objective(s) for each phase of the work.

B. SCOPE OF WORK

This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work for each Phase.

C. TASKS TO BE PERFORMED

Tasks, concisely written, should be provided in a logical sequence and should be divided into the phases of the project. This section provides a brief summary of the planned approach to this project.

PHASE I

Task 1.0 - (Title)

(Description)

Subtask 1.1 (Optional)

(Description)

Task 2.0 - (Title)

PHASE II (Optional)

Task 3.0 - (Title)

D. DELIVERABLES

The periodic, topical, and final reports shall be submitted in accordance with the attached "Federal Assistance Reporting Checklist" and the instructions accompanying the checklist.

The Recipient shall provide a list of deliverables other than those identified on the "Federal Assistance Reporting Checklist" that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives.

1. Task 1.1 - (Report Description)
2. Task 2.2 - (Report Description)

E. BRIEFINGS/TECHNICAL PRESENTATIONS (If applicable)

1. The Recipient shall prepare detailed briefings for presentation to the COR at the COR's facility located in Pittsburgh, PA or Morgantown, WV. Briefings shall be given by the Contractor to explain the plans, progress, and results of the technical effort [SPECIALIST: PROVIDE THE FREQUENCY AND NUMBER OF BRIEFINGS EXPECTED]
2. The Recipient shall provide and present a technical paper(s) at the DOE/FETC Annual Contractor's Review Meeting to be held at the FETC facility located in Pittsburgh, PA or Morgantown, WV.

SECTION VII -- EVALUATION AND SELECTION

7.1 INTRODUCTION (JULY 1999)

This section of the solicitation presents to the applicant the actual evaluation scheme, as well as the individual criterion used by DOE to evaluate the application. It is also important to note that this section contains specific directions that applicants must follow in preparing their application in order to ensure maximum consideration.

7.2 GENERAL (JULY 1999)

It is the policy of DOE that any financial assistance be awarded through a merit-based selection process which means a thorough, consistent and independent examination of applications based on pre-established criteria by persons knowledgeable in the field of the proposed project.

7.3 PRELIMINARY EVALUATION (JULY 1999)

Prior to a comprehensive evaluation, applications will undergo an initial review to determine whether the information required by the solicitation has been submitted and is properly completed. Applications will be reviewed for relevance to the Environmental Program and for responsiveness to the technical requirements of the solicitation. Applications that require cost-sharing will be reviewed to insure that this requirement has been met. Volume I of the application will be reviewed to assess the applicant's eligibility under the lobbying, EPACT and Simpson-Craig Amendment requirements. Failure to successfully meet any one of these preliminary evaluation criteria will result in the elimination of the application and no further consideration in the comprehensive evaluation. In the event that an application is eliminated, a notice will be sent to the Applicant stating the reason(s) that the application will not be considered for financial assistance under this solicitation.

7.4 COMPREHENSIVE EVALUATION (JULY 1999)

Applications passing the preliminary evaluation shall be subject to a comprehensive evaluation in accordance with the technical evaluation criteria listed in this section.

The technical evaluation is conducted to determine the merits of the technical application with regard to the potential success of the project as well as future commercial applications. Comprehensive evaluation results in a numerical score for each application against each of the technical evaluation criteria.

The Environmental, Health, Safety, and Security (EHSS) Evaluation, which is not point scored, is conducted to determine the completeness of the Environmental Questionnaire, and to assess the applicant's awareness of EHSS requirements for mitigating project related EHSS risks and impacts.

The cost evaluation, which is not point scored, is conducted to determine the completeness of the cost estimate, appropriateness and reasonableness of the cost, and to assess the applicant's understanding of the Statement of Project Objectives.

7.5 TECHNICAL EVALUATION CRITERIA (AUG 1999)

Technical applications submitted in response to this solicitation will be evaluated and scored in accordance with the criteria listed below:

1. SCIENTIFIC AND TECHNICAL MERIT

Significant scientific and/or technically challenging concepts. The extent to which the proposed work moves beyond the current state-of-the-art. Readily distinguishable approach from past and current practice and investigations. The possibility of a scientific or engineering breakthrough. The extent to which the application of the proposed concept would reduce emissions below those resulting from improvements or advances in system cycle efficiencies; provides for reuse or production of valuable byproducts; or provides innovative

long-term storage or disposal of greenhouse gases. The expected compatibility of the technology with the environment, including protection of human health and sensitive ecosystems.

2. TECHNICAL APPROACH AND UNDERSTANDING

The manner in which the offeror proposes to accomplish the work as evidenced by the quality, conciseness, and completeness of the proposal, including identification of anticipated problems and proposed solutions. The soundness and level of adequacy of the proposed work to show progress toward proving the feasibility of the concept. The degree to which the activity is likely to produce other benefits, in addition to sequestration. Clarity of the discussion of the technical basis for the proposed work including discussions on relevant technical issues, existing technical barriers, and pertinent research past and current. Technology effectively related to the solicitation objectives.

3. SEQUESTRATION POTENTIAL

The maximum expected emission reduction or offset of greenhouse gas, expressed in millions of tons per year of carbon equivalent. The potential impact in terms of applicability to a large number of sites or types of sources, and quantity (tons) of greenhouse gases that would be recovered or sequestered, and the feasibility of the proposed concept for the development of path-breaking, less costly means to addressing greenhouse gas emissions. The ability of the technology to address different types of emission sources. If activities, including research on improving scientific knowledge and understanding or developing modeling and assessment tools are proposed, the extent to which the knowledge can serve as a basis for the development of technologies to impact large quantities of greenhouse gases.

4. LIKELIHOOD OF COMMERCIAL APPLICATION

The expected cost of the commercial sequestration technology, expressed in dollars per ton of carbon equivalent emission avoided. Capability to compete with commercial processes. The degree to which the activity identifies and makes progress on new concepts, thereby increasing the likelihood of a successful sequestration program. Participation of parties capable of commercializing or producing products using the proposed technology. The length of time before the project is likely to be commercially successful. The likelihood of obtaining patent or property rights. Significant cost sharing including in-kind contributions and corporate commitment. If fundamental scientific knowledge and understanding is proposed, the extent to which the knowledge can serve as a basis for the development of commercial technologies.

5. QUALIFICATION OF ORGANIZATION AND KEY PERSONNEL and ADEQUACY of FACILITIES/RESOURCES

The qualifications and pertinent experience of the Principal Investigators (PI), other key staff, and consultants, if any. The qualifications of any proposed U.S. industrial partner in regard to the capability to demonstrate successful technologies at large scale. The rationale for and corporate commitment to any teaming arrangement. Availability and time commitments of proposed personnel.

Type, quality, and availability of the proposed equipment, materials, and facilities. Adequacy of the proposed facilities to conduct and support laboratory/bench scale testing, prototype development, and field testing activities. Justification for purchase or lease of facilities, equipment, or materials.

The evaluation of proposals will be conducted using preestablished weights to determine the relative merits of the contractor's proposal in accordance with the technical evaluation criteria.

7.6 ENVIRONMENTAL HEALTH SAFETY AND SECURITY EVALUATION CRITERIA (JULY 1999)

The Environmental Questionnaire will be evaluated in order to: determine adequacy and completeness of furnished data, assess the applicant's awareness of EHSS requirements, including mitigating any project related EHSS risks and impacts.

7.7 COST EVALUATION CRITERIA (JULY 1999)

The costs proposed will be evaluated in accordance with the following criteria:

- a. Reasonableness and appropriateness of cost
- b. Evaluated probable cost to the Government

Selection of an offeror for award may involve a determination as to whether an otherwise technically superior proposal is worth any additional associated cost.

7.8 RELATIVE ORDER OF IMPORTANCE OF EVALUATION CRITERIA (JULY 1999)

The evaluation of the technical application will be conducted using preestablished weights to determine the relative merits of the application in accordance with the technical evaluation criteria. The technical evaluation (Volume II - Technical Application) represents 100% of the total evaluation scoring. Although Volume I - Business and Financial Application will not be point scored it will be considered in the selection decision and must be addressed.

The following weighting factors will be applied to each technical evaluation criteria to obtain a final evaluation rating for each application.

- 1. Scientific and Technical Merit 25%
- 2. Technical Approach and Understanding 25%
- 3. Sequestration Potential 25%
- 4. Likelihood of Commercial Application 15%
- 5. Qualification of Organization and Key Personnel and Adequacy of Facilities/Resources 10%

7.9 APPLICATION OF PROGRAM POLICY FACTORS (JULY 1999)

These factors, while not indicators of the Applicant's merit, e.g., technical excellence, cost, proposer's ability, etc., may be essential to the process of selecting the application(s) that, individually or collectively, will best achieve the program objectives. Such factors are often beyond the control of the Applicant. Applicants should recognize that some very good applications may not receive an award because they do not fit within a mix of projects which maximizes the probability of achieving the DOE's overall research and development objectives. Therefore, the following Program Policy Factors may be used by the Source Selection Official to assist in determining which of the ranked application(s) shall receive DOE funding support.

- 1. It is desirable to select for award a group of projects which represents a diversity of technical approaches and methods that can make a substantial contribution to the development of technological options for greenhouse gas emissions reduction;
- 2. It may be desirable to support complementary and/or duplicative efforts or projects which, when taken together, will best achieve the research goals and objectives.
- 3. It may be desirable to select projects which complement the scope, timing, and programmatic visibility of the sequestration portfolio;
- 4. It may be desirable to support activity that addresses different kinds, sizes, and locations of organizations selected for an award in order to provide a balanced programmatic effort and a variety of different technical perspectives.

The above factors will be independently considered by the Source Selection Official in determining the optimum mix of applications that will be selected for support. These policy factors will provide the Source Selection Official with the capability of developing, from the competitive solicitation, a broad involvement of organizations and organizational ideas, which both enhance the overall technology research effort and upgrade the program content to meet the goals of the DOE.

7.10 BASIS FOR SELECTION AND AWARD (JULY 1999)

The Department of Energy anticipates the award of multiple cooperative agreement instruments to those applicants whose applications are determined to be in the best interest of the Department in achieving the program objectives set forth in this solicitation. Selection of an application by the Department will be achieved through a process of evaluating and comparing the relative merits of the applicant's complete applications, in accordance with all of the evaluation factors set forth in this section and applying the Program Policy Factors.

This process reflects the Department's desire to accept an application based on its potential in best achieving program objectives, rather than solely on evaluated technical merit or cost. Accordingly, the Department of Energy may select for an award all, none, or any number or part, of an application, based on its decision as to which meritorious applications best achieve the program objectives set forth in this solicitation.

It is important for applicants to note that selection for negotiations will be made entirely on the basis of applications submitted. Applications should, therefore, address specifically the factors mentioned in the evaluation criteria, and not depend upon reviewers' background knowledge.